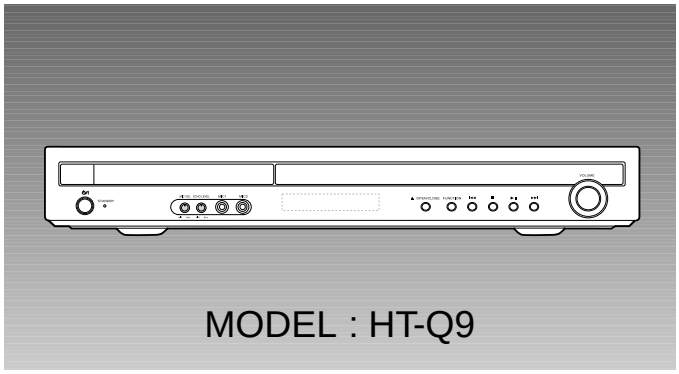
SAMSUNG

DVD RECEIVER AMP

BASIC MODEL : HT-Q9

SERVICE Manual

DVD RECEIVER AMP SYSTEM



MODEL : HT-Q9

Features

* Multi-Disc Playback & FM Tuner
* Dolby Pro Logic II
* DTS (Digital Theater Systems)
* TV Screen Saver Function
* Power Saving Function
* Customized TV Screen Display

- Confidential -

ELECTRONICS

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INDEX

Ch1 | Precautions

1-1. Safety Precautions 1-1
1-2. Servicing Precautions 1-2
1-3. Precautions for Electrostatically Sensitive Device (ESDs) 1-3
1-4. Special Precations and Waring Lables for Laser Products 1-4
1-5. Special Precautions for HDD 1-5

Ch2 | Product Descriptions

1. Product Feature 2-1
2. Specifications 2-2
3. Accessories 2-3

Ch3 | Product Functions

1. Connecting the Speakers 3-1
2. Basic Functions 3-3
3. New Functions 3-10

Ch4 | Adjustments

No Reference

Ch5 | How to disassemble

How to disassemble 5-1

Ch6 | Troubleshooting

1. Main (Power) 6-1
2. Output Failure (for 2Ch Analog Input) 6-2

Ch7 | Exploded View & Parts List

1. Total Exploded View 7-1
2. Parts List 7-2

Ch8 | Electrical Parts List

Electrical Parts List 8-1

Ch9 | Block Diagram

1. MAIN BLOCK DIAGRAM 9-1

Ch10 | Wiring Diagram

No Reference

Ch11 | PCB Diagram

1. PCB Layout 11-1

Ch12 | Schematic Diagram

1. MAIN-1 12-1
2. MAIN-2 12-2
3. AMP 12-3
4. FUNCTION 12-4
5. RF 12-5
6. SMSP 12-6

Ch13 | Circuit Description

1. Description 13-1
2. Function Description 13-3

Ch14 | HTS Reference

1. HTS (Home Thater Sytsem) 14-1
2. About “Sound” 14-2
3. 5.1 Channel Sound 14-3
4. HTS Sonud Format 14-4
5. HTS Devices 14-5

1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced.

2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people--particularly children--might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.

5. Leakage Current Hot Check (Figure 1-1):
   Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, *Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

   With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, etc.) and all exposed metal parts. Examples: Handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat.

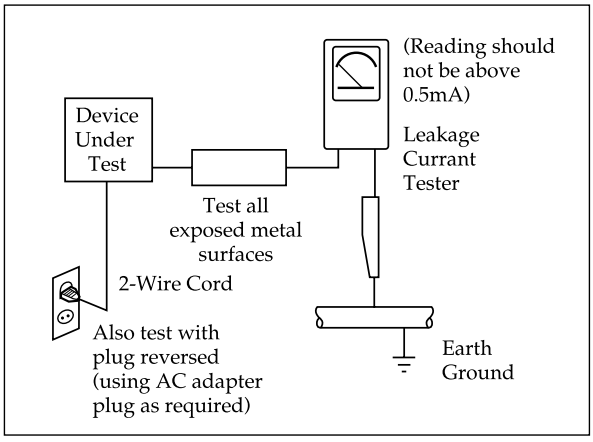

(Reading should not be above 0.5mA)
Device Under Test
Leakage Currant Tester
Test all exposed metal surfaces
2-Wire Cord
Also test with plug reversed (using AC adapter plug as required)
Earth Ground

Fig. 1-1 AC Leakage Test

6. Insulation Resistance Cold Check:
   (1) With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. (2) Set the power switch to ON. (3) Measure the resistance between the shorted AC plug and any exposed metallic parts. Example: Screwheads, antenna, control shafts or handle brackets.

   If any of the exposed metallic parts has a return path to the chassis, the measured resistance should be between 1 and 5.2 megohms. If there is no return path, the measured resistance should be "infinite." If the resistance is outside these limits, a shock hazard might exist. See Figure 1-2

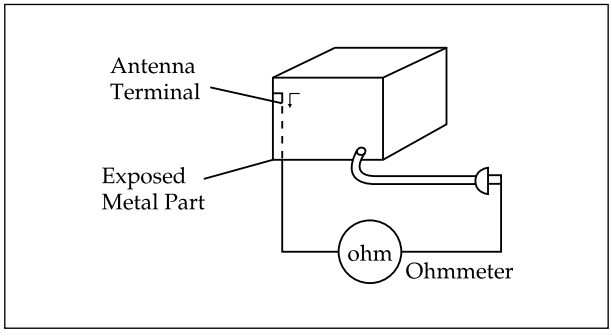


Fig. 1-2 Insulation Resistance Test

1-1 Safety Precautions (Continued)

7. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards

8. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that no wires or components touch thermally hot parts.

9. Product Safety Notice:
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original--even if the replacement is rated for higher voltage, wattage, etc.

10 Components that are critical for safety are indicated in the circuit diagram by shading, ⚠ or ⚠ . Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Servicing Precautions

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

1. Servicing precautions are printed on the cabinet. Follow them.

2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring may be clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).

6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.

2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power--this is an electric shock precaution.)

3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.

4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.

5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.

6. Use only an anti-static solder removal device. Many solder removal devices are not rated as "anti-static" (these can accumulate sufficient electrical charge to damage ESDs).

7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

9. Minimize body motions when handing unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4 Special Precautions and Warning Labels for Laser Products

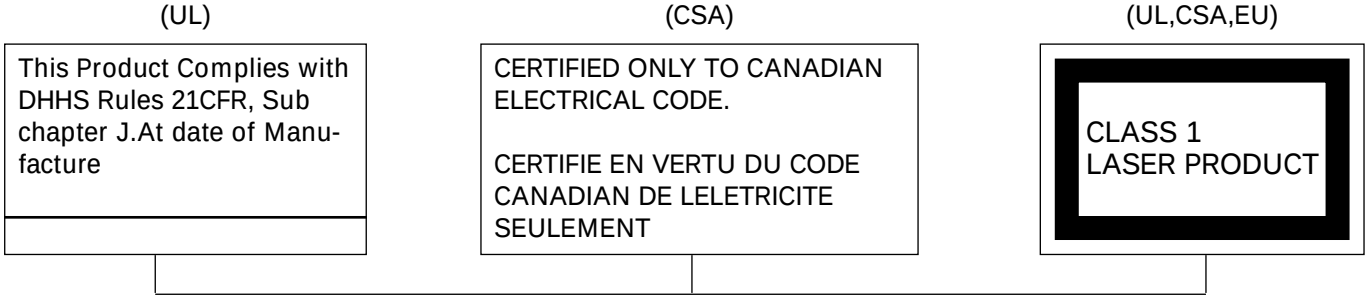

(UL)
This Product Complies with DHHS Rules 21CFR, Sub chapter J.At date of Manu-facture
(CSA)
CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE.
CERTIFIE EN VERTU DU CODE CANADIAN DE LELETRICITE SEULEMENT
(UL,CSA,EU)
CLASS 1
LASER PRODUCT

Fig. 1-3 Warning Labels (Location: Enclosure Block)

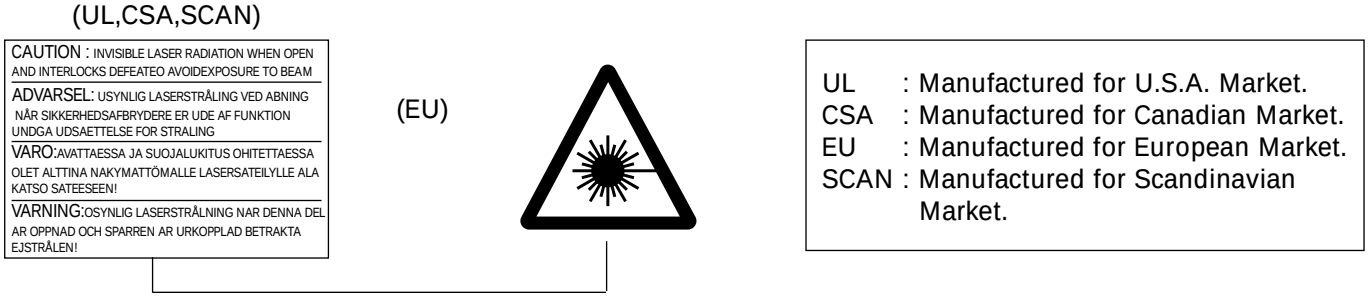

(UL,CSA,SCAN)
CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATEO AVOIDEXPOSURE TO BEAM
ADVARSEL: USYNLIG LASERSTRÅLING VED ABNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRALING
VARO:AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NAKYMATTÖMALLE LASERSATEILYLLE ALA KATSO SATEESEEN!
VARNING:OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPARREN AR URKOPPLAD BETRAKTA EJSTRÅLEN!
(EU)
UL : Manufactured for U.S.A. Market.
CSA : Manufactured for Canadian Market.
EU : Manufactured for European Market.
SCAN : Manufactured for Scandinavian Market.

Fig. 1-4 Warning Labels (Location: Disc Clamper, Inner Side of Unit Door or Nearby Unit Chassis)

1-4 Special Precautions and Warning Labels for Laser Products (Continued)

1-4-1 Warnings

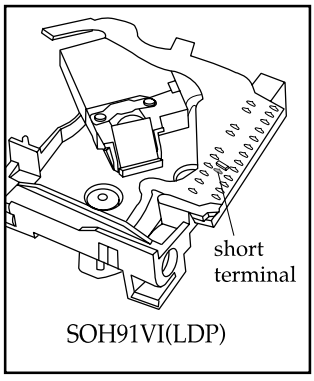
1. When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30 cm from the surface of the objective lens on the optical pick-up block.

2. Do not attempt to handle the objective lens when the DISC is not on the tray.

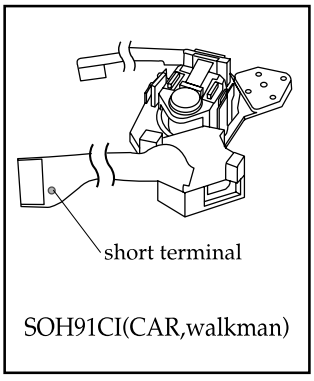
1-4-2 Laser Diode Specifications

Material: GaAs+ GaAlAs
Wavelength: 760-800 nm
Emission Duration: Continuous

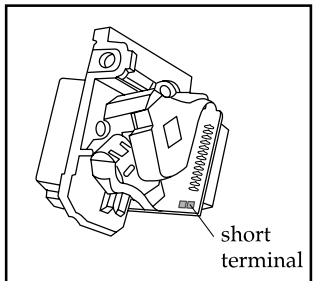
Laser Output: 0.2 mw (measured at a 1.6 mm distance from the objective lens surface on the optical pick-up block.)



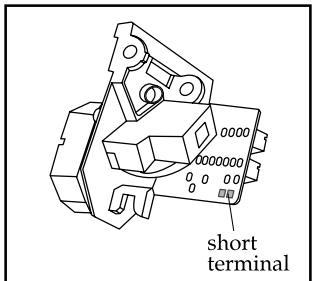
SOH91VI(LDP)



SOH91CI(CAR,walkman)



SOH-A1
(CMS-V10,CMS-V30)



SOH94T4N
(CMS-V10,CMS-V30)

1-4-3 Handling the Optical Pick-up

1. Static electricity from clothing or the body may cause electrostatic breakdown of the laser diode in the Optical Pickup. Follow this procedure:

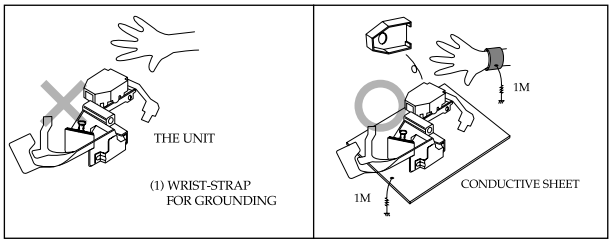
2. Place a conductive sheet on the work bench (i.e., the black sheet used for wrapping repair parts.) Note: The surface of the work bench should be covered by a copper ground plane, which is grounded.

3. The repair technician must wear a wrist strap which is grounded to the copper sheet.

4. To remove the Optical Pickup block: Place the set on the conductive sheet, and momentarily touch the conductive sheet with both hands. (While working, do not allow any electrostatic sources--such as clothes--to touch the unit.)

5. Ground the "Short Terminal" (located on the PCB, inside the Pickup Assembly) before replacing the Pickup. This terminal should be shorted whenever the Pickup Assembly is lifted or moved.

6. After replacing the Pickup, reopen the Short Terminal. See diagrams below:

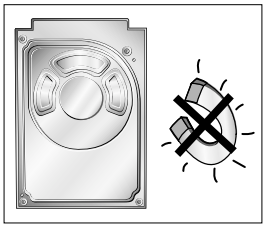


1-5 Special Precautions for HDD

* HDD Data Maintenance Step

1. Since the data on the HDD is weak to mechanical shock, place the HDD in a safe location that is free from mechanical shock once it is removed from the main unit.

2. In order to safe keep the data on the HDD, back up the data before the repair or make sure not to place the HDD near any electrical appliance that generates a strong magnetic field.

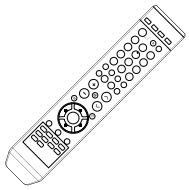


2. Product Descriptions

1. Product Feature

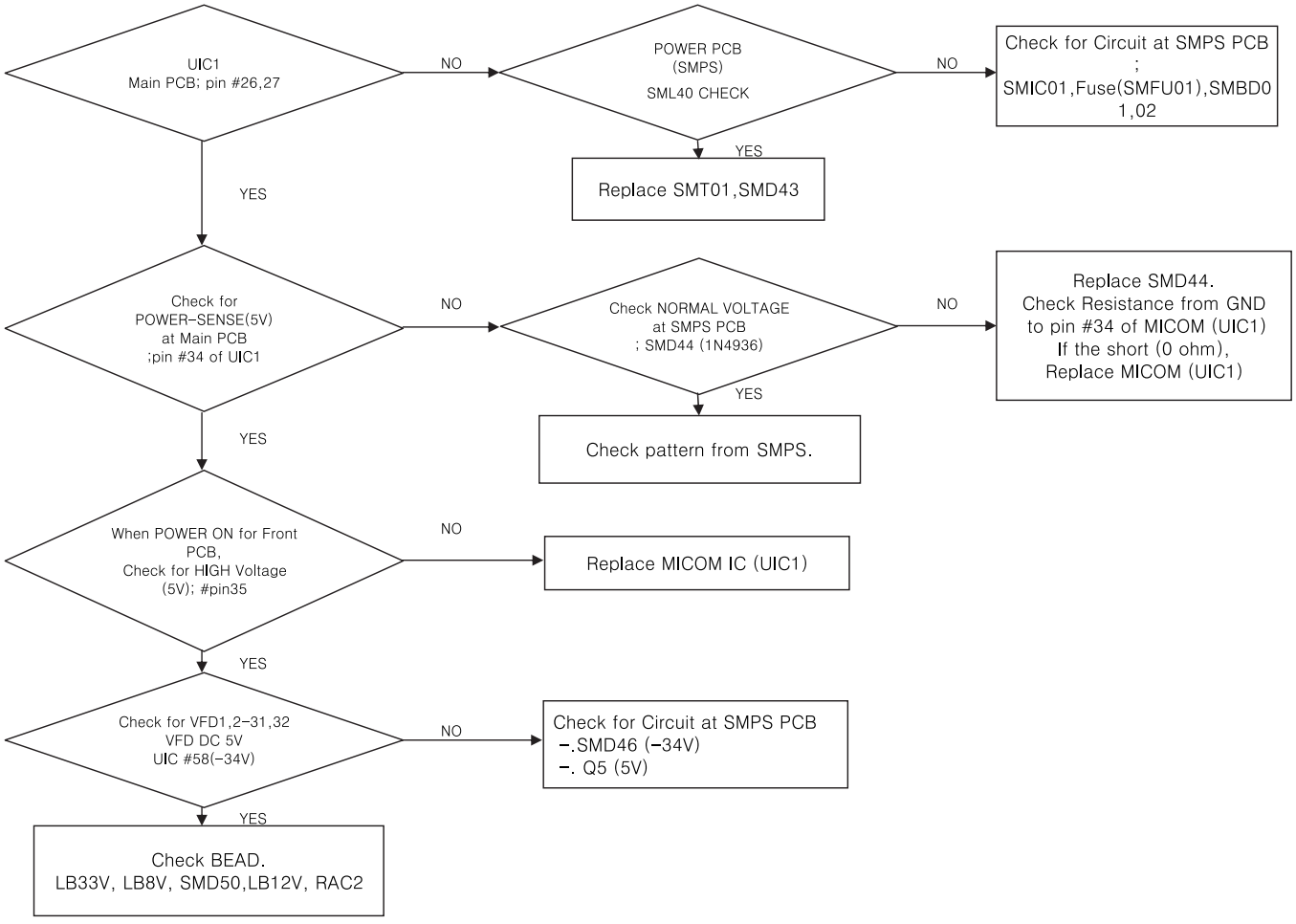
	Product Feature
Multi-Disc Playback & FM Tuner	▪ The HT-Q9 combines the convenience of multi-disc playback capability, including DVD-VIDEO, VCD, CD, MP3-CD, WMA-CD, DivX, CD-R/RW, and DVD-R/RW, with a sophisticated FM tuner, all in a single player.
Dolby Pro Logic II	▪ Dolby Pro Logic II is a new form of multi-channel audio signal decoding technology that improves upon existing Dolby Pro Logic.
DTS (Digital Theater Systems)	▪ DTS is an audio compression format developed by Digital Theater Systems Inc. It delivers full-frequency 5.1 channel sound.
TV Screen Saver Function	▪ The HT-Q9 automatically brightens and darkens your TV screen after 3 minutes in the stop mode. The HT-Q9 automatically switches itself into the power saving mode after 20 minutes in the screen saver mode.
Power Saving Function	▪ The HT-Q9 automatically shuts itself off after 20 minutes in stop mode.
Customized TV Screen Display	▪ The HT-Q9 allows you to select your favorite image during JPEG, DVD or VCD playback and set it as your background wallpaper.

GENERAL	Power Consumption	20W		
	Weight	2.6Kg		
	Dimensions (W x H x D)	430 x 65.5 x 256.5 mm		
	Operating Temperature Range	+5°C~+35°C		
	Operating Humidity Range	10% ~ 75%		
FM TUNER	Usable Sensitivity	10dB		
	S/N Ratio	60dB		
	Distortion	0.5%		
VIDEO OUTPUT	Composite Video	1.0Vp-p(75Ω load)		
	Component Video	Y:1.0Vp-p(75Ω load)		
		Pr:0.70Vp-p(75Ω load)		
		Pb:0.70Vp-p(75Ω load)		
AMPLIFIER	Front speaker output	30W x 2(4Ω)		
	Center speaker output	30W(4Ω)		
	Rear speaker output	30W x 2(4Ω)		
	Subwoofer speaker output	30W(8Ω)		
	Frequency range	20Hz~20KHz		
	S/N Ratio	75dB		
	Channel separation	60dB		
	Input sensitivity	(AUX)500mV		
SPEAKER	Speaker system	5.1ch speaker system		
		Front/Center/Rear speaker		Subwoofer speaker
	Impedance	4Ω		8Ω
	Frequency range	140Hz~20KHz		35Hz~140Hz
	Output sound pressure level	85dB/W/M		85dB/W/M
	Rated input	30W		30W
	Maximum input	60W		60W
	Dimensions (W x H x D)	Front/Rear	92 x 102x 96.5 mm	130 x 320 x 314 mm
		Center		
	Weights	Front/Rear	0.5 Kg/0.5 Kg	3.3 kg
		Center	0.5 Kg	

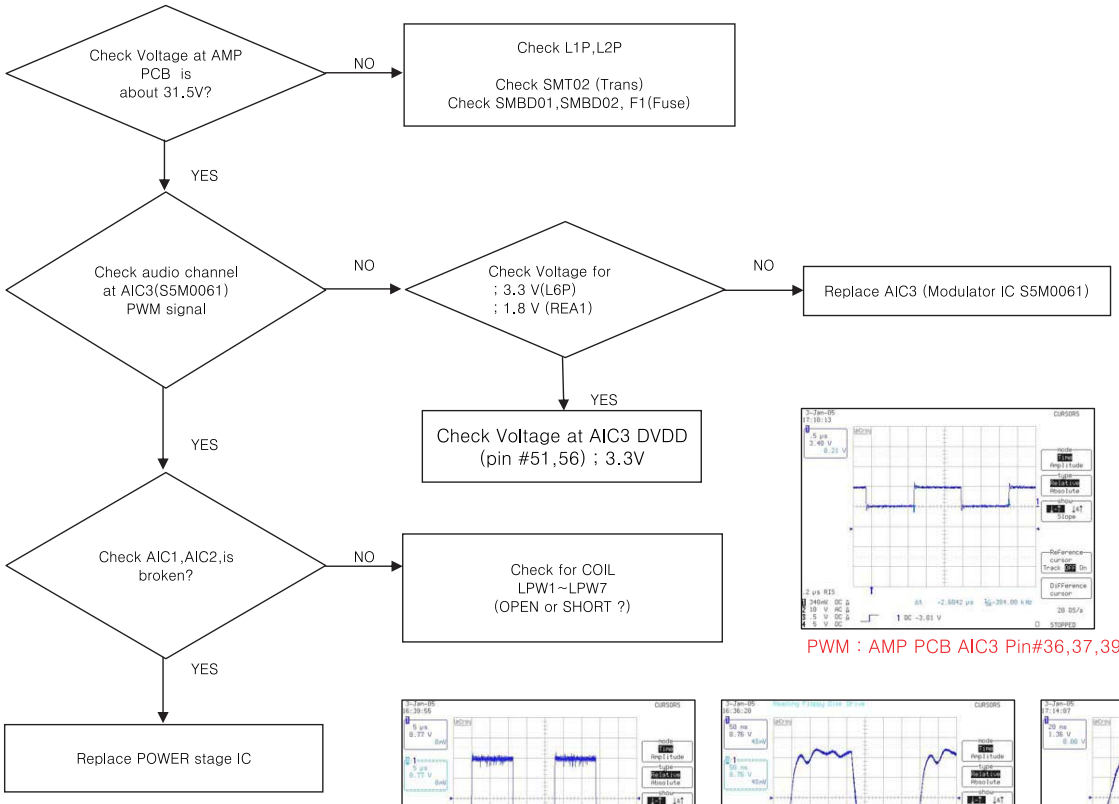
Accessories	Name	Code No.
	Remote control	AH59-01657A
	Audio Cable	AH39-40001Y
	FM antenna	AH42-00021A

6. Troubleshooting

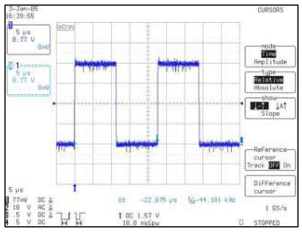
1. Main (Power)



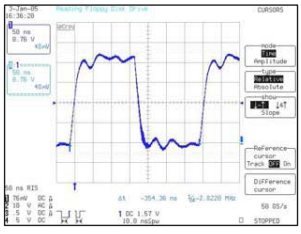
2. Output Failure (for 2Ch Analog Input)



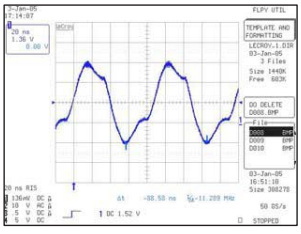
PWM : AMP PCB AIC3 Pin#36,37,39,43,45,47,48,49,50



LRCLK : AMP PCB AIC3 Pin#7



BCLK : AMP PCB AIC3 Pin#8

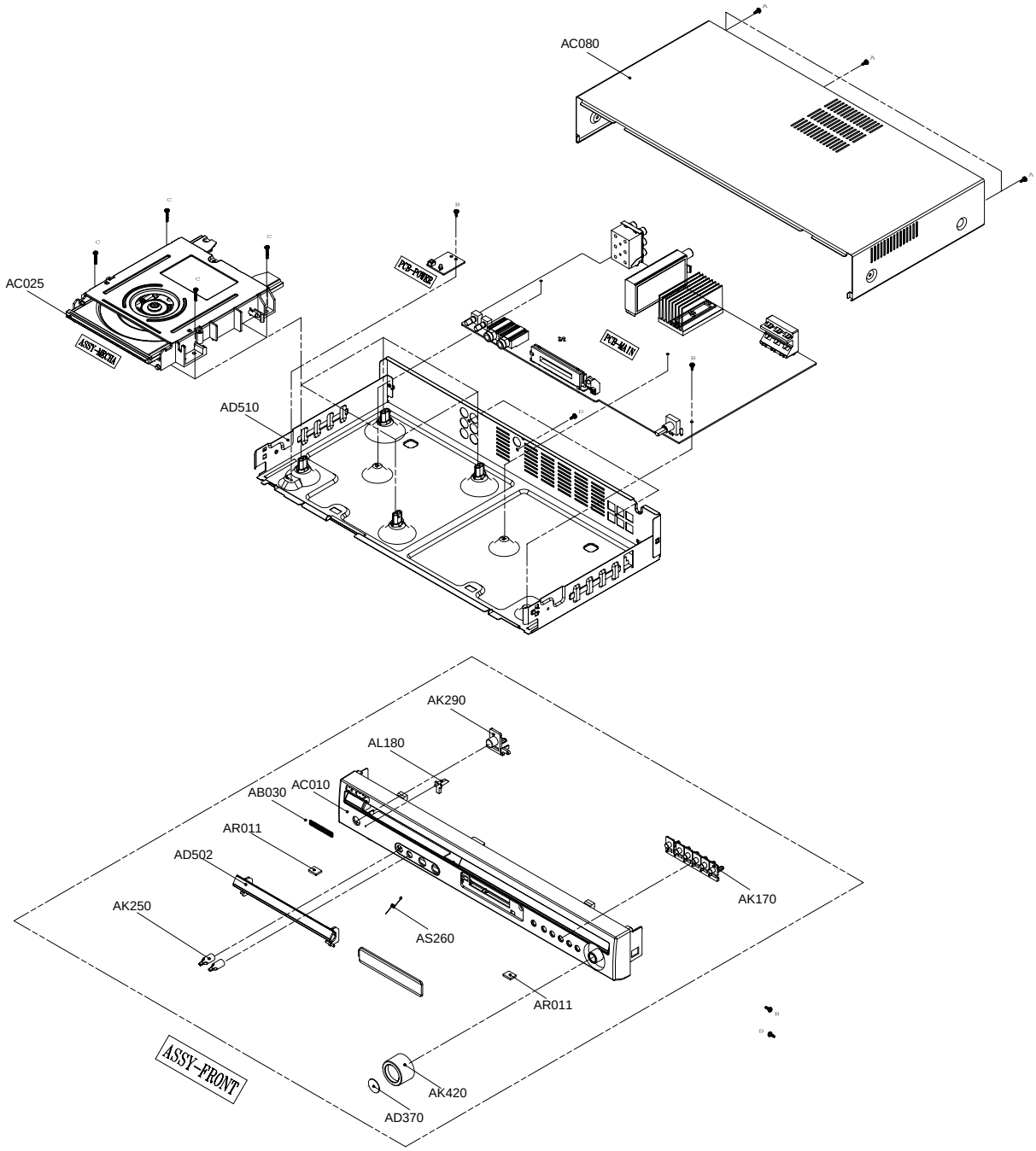


MCLK : AMP PCB AIC3 Pin#6

7.Exploded View & Parts List

1. Total Exploded View

<HT-Q9 EXPLODED VIEW>



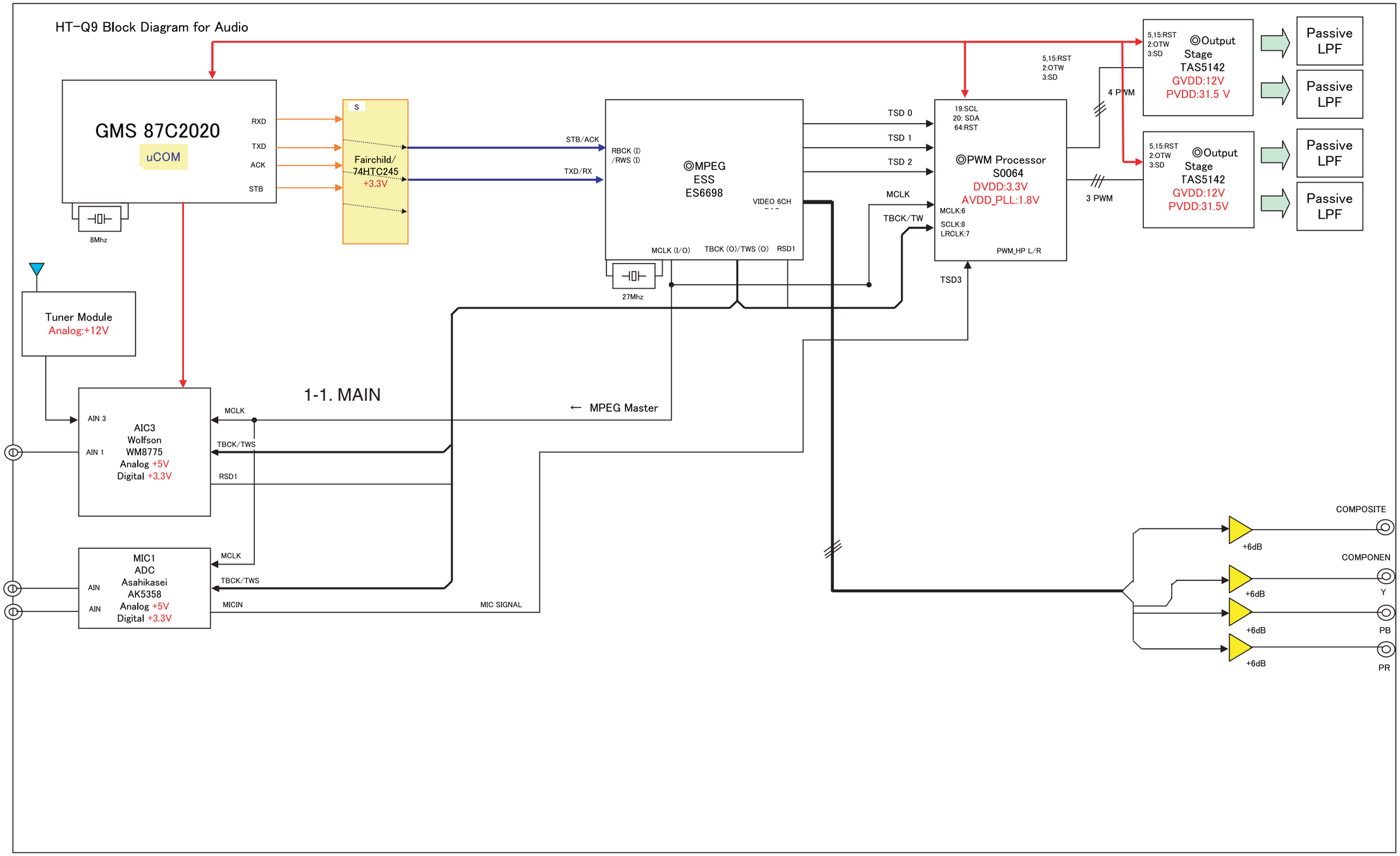
LOC.	PART NAME	PART CODE	MATERAIL SPEC	Q'TY	REMARK
AK250	KNOB-MIC	AH64-03687B	ABS	2	
AD502	DOOR-DVD	AH64-04017A	ABS	1	SNA
AR011	RUBBER-FOOT	AH73-00005A	RUBBER	2	
AB030	BADGE-BRAND	AH64-03746A	AL	1	
AC010	CABINET-FRONT	AH64-04014A	HIPS	1	SNA
AL180	LENS-STAND BY	AH67-00438A	PMMA	1	SNA
AK290	KNOB-POWER	AH64-04016A	ABS	1	SNA
AS260	SPRING-DOOR	AH61-02122B	SUS304	1	
AK420	KNOB-VOL	AH64-04030A	ABS	1	SNA
AD370	DECO-VOL	AH64-03789A	PC	2	SNA
AK170	KNOB-FUNCTION	AH64-04015A	ABS	1	SNA
AC025	CABINET-BOTTOM	AH64-04012A	SECC 0.6T	1	
AD510	DOOR-TRAY	AH64-02320B	ABS	1	
-	HOLDER-MECHA	AH61-02182A	ABS	1	
-	HOLDER-VFD	AH61-02181A	ABS	1	
-	HOLDER-IC	AH61-02183A	ABS+GF30%	1	
-	H-SINK AMP	AH62-00146B	AL	1	
AC080	CABINET-TOP	AH64-04013A	SECC 0.5T	1	
A	TAPTITE SCREW	6003-001499	BWH 3*10 SILVER	3	
B	TAPTITE SCREW	6003-001561	BH 3 *6 YEL	2	
C	TAPTITE SCREW	6003-000280	BH 3*25 YEL	4	
D	TAPTITE SCREW	6003-000275	BH 3*10 BLACK	3	

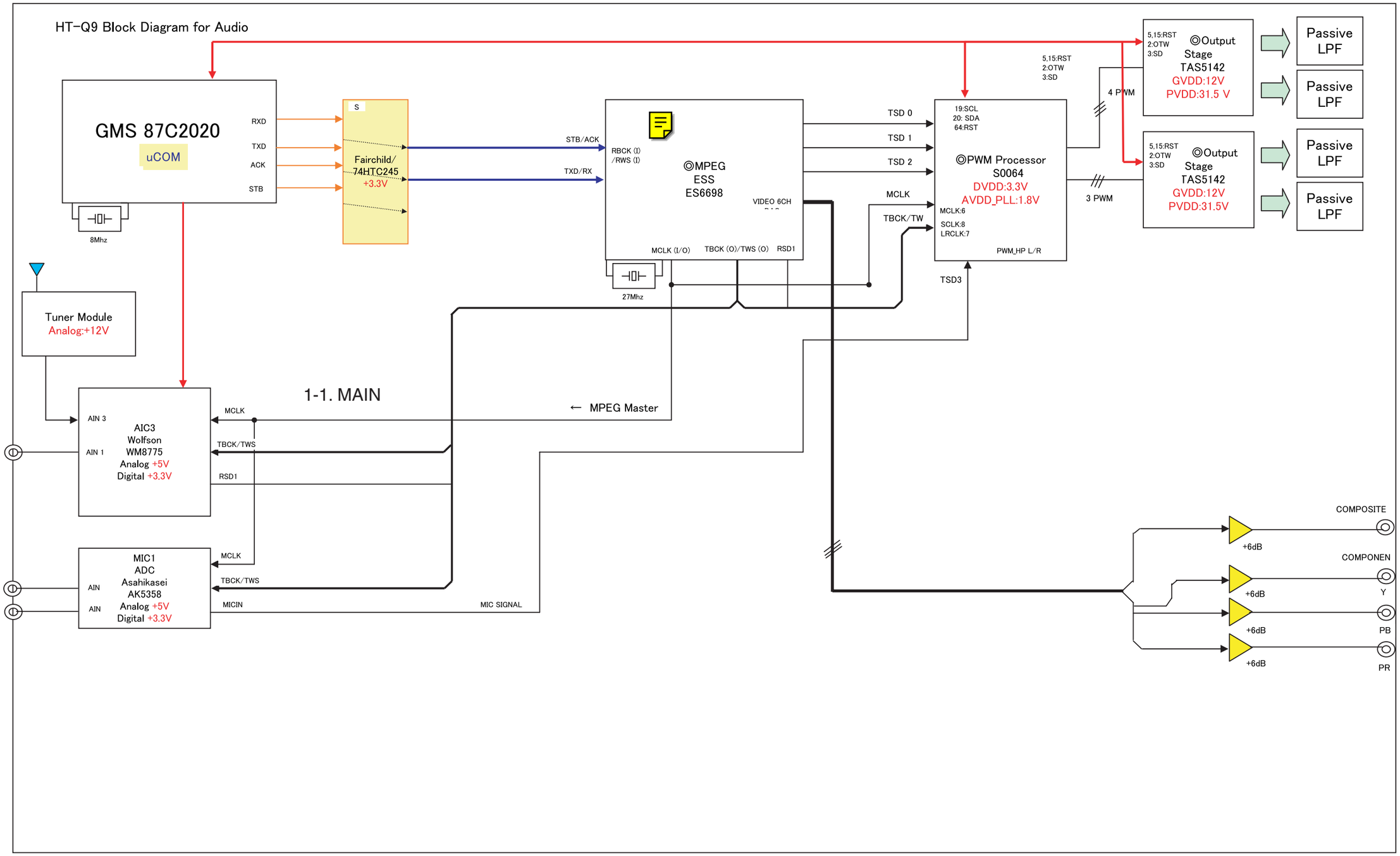
8. Electrical Parts List

*** HT-Q9 Parts List ***

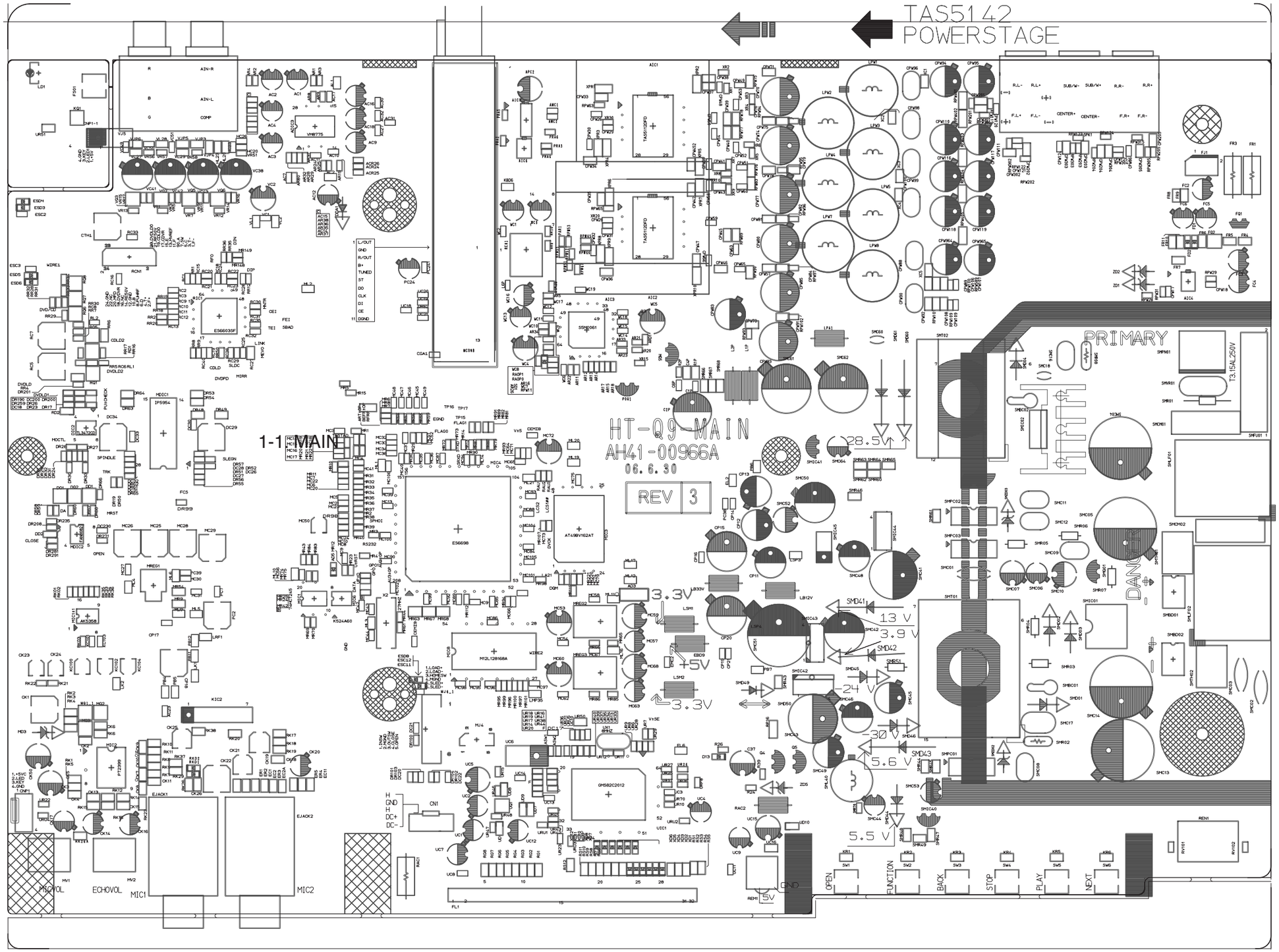
Location no.	Code no.	Description & Specification	Remarks
AC2	2401-000651	C-AL;2.2uF,20%,50V,GP,TP,4x7,5	
AC23	2203-002398	C-CER,CHIP;22nF,10%,50V,X7R,1608	
AC7	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,1608	
ACR24	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	
AD510	AH64-02320A	DOOR-TRAY;HT-DB300,ABS,-,-,-,-,NTR,-	
ADIC3	1002-001392	IC-A/D CONVERTER;WM8775EDS,24BIT,SSOP,28	
AIC2	1201-002342	IC-AUDIO AMP;S1S4001,SSOPH,56P,18.4x7.5m	
AIC3	1204-002548	IC-MODULATOR;S5M0061,TQFP,64P,10x10mm,PL	
AIC4	0801-002455	IC-CMOS LOGIC;74LV74,DUAL D F/F,TSSOP,14	
AIC5	0801-001055	IC-CMOS LOGIC;74VHC08,AND GATE,SOP,14,15	
AR1	2007-000130	R-CHIP;39Kohm,5%,1/10W,TP,1608	
AR11	2007-000309	R-CHIP;10ohm,5%,1/10W,TP,1608	
AR15	2007-000072	R-CHIP;47ohm,5%,1/10W,TP,1608	
AR3	2007-000086	R-CHIP;5.6Kohm,5%,1/10W,TP,1608	
AR33	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	
AR34	2007-000121	R-CHIP;820ohm,5%,1/10W,TP,1608	
AR8	2007-000091	R-CHIP;12Kohm,5%,1/10W,TP,1608	
C1P	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,1608	
C1S	2305-000412	C-FILM,LEAD-PEF;470nF,5%,63V,TP,-,5mm	
C2P	2401-000847	C-AL;220uF,20%,35V,GP,TP,10x12mm,5m	
C2RR	2203-000783	C-CER,CHIP;0.33nF,5%,50V,C0G,1608	
C37	2401-001508	C-AL;47uF,20%,16V,GP,TP,6.3x5,5	
C3A	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	
C3S	2203-000260	C-CER,CHIP;10nF,10%,50V,X7R,2012	
C4P	2203-001537	C-CER,CHIP;1nF,10%,50V,X7R,TP,2012	
CD000	AH61-01741A	BASE-MAIN;K100,ABS,-,-,-,-,-	
CD300	AH66-00217A	GEAR-TRAY;CMS-SD100,POM,-,-,-,BLACK,-,-,	
CD340	AH66-00262A	LEVER-LIFT;-,ABS,-,-,-,-,BLK,-	
CD380	AH66-00215A	PULLEY MOTOR;CMS-SD100,POM,-,WHITE,-,-,-	
CD520	3409-001138	SWITCH-DETECTOR;5V DC,1A,DPST,30GF,-	
CK1	2402-000008	C-AL,SMD;47uF,20%,16V,GP,TP,6.6x6.6x5.4	
CK11	2203-000716	C-CER,CHIP;3.3nF,10%,50V,X7R,2012	
CK14	2401-001952	C-AL;4.7uF,20%,50V,GP,TP,5x7mm,5mm	
CK16	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
CK19	2401-000918	C-AL;22uF,20%,16V,GP,-,6.3x7,5	
CK21	2401-001887	C-AL;0.1uF,20%,50V,-,TP,4x7mm,5	
CK23	2402-000130	C-AL,SMD;2.2uF,20%,50V,GP,TP,4.3x4.3x5.	
CK26	2203-000595	C-CER,CHIP;0.22nF,5%,50V,C0G,2012	
CK7	2203-005550	C-CER,CHIP;82nF,10%,50V,X7R,TP,2012,-	
CK9	2203-001058	C-CER,CHIP;0.56NF,5%,50V,C0G,TP,2012	
CN1	3711-000483	HEADER-BOARD TO CABLE;BOX,5P,1R,2mm,STRA	
CNP1	3711-000471	HEADER-BOARD TO CABLE;3WALL,4P,1R,2mm,ST	
CNP1-	AH39-00754A	LEAD CONNECTOR;HT-P50,4P,2mm,70mm,1007#2	
CP11	2401-001102	C-AL;330uF,20%,16V,GP,TP,8x11.5mm,5	
CP18	2402-001198	C-AL,SMD;330UF,20%,6.3V,GP,TP,6.6X6.6X7	
CP20	2401-001364	C-AL;470uF,20%,16V,GP,TP,10x12.5,5	
DC18	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,1608	
DC30	2203-000189	C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608	
DD1	0407-000116	DIODE-ARRAY;DAP202K,80V,100mA,CK2-3,SOT-	
DD2	0403-001062	DIODE-ZENER;UDZ4.7B,4.55-4.75V,200MW,SOD	
DDA1	0404-000156	DIODE-SCHOTTKY;RB441Q,40V,350MA,DO-34,TP	
DIC2	1201-001842	IC-OP AMP;TL3472CD,SO,TP,8P,-,DUAL,-,PAL	
DR27	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	
DR28	2007-000109	R-CHIP;1Mohm,5%,1/10W,TP,1608	
DR281	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	
DR29	2007-000120	R-CHIP;680ohm,5%,1/10W,TP,1608	
DR30	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR31	2007-000458	R-CHIP;18Kohm,5%,1/10W,TP,1608	
DR55	2007-000134	R-CHIP;33Kohm,5%,1/10W,TP,1608	
DR57	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	
DR64	2007-000483	R-CHIP;1OHM,5%,1/8W,TP,2012	
EJACK	3722-000363	JACK-PHONE;9P,AU,BLK,ANGLE	
ER1	2007-000682	R-CHIP;3.3Kohm,1%,1/8W,TP,2012	
ER2	2007-000931	R-CHIP;470ohm,5%,1/8W,TP,2012	
FL1	AH07-00190A	VF DISPLAY;HNV-08SS71,HT-Q9,75x18.5x6.8,	
FS01	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	
FUSEC	3602-000147	FUSE-CLIP;250V,7.5A,30mohm	
HC20	2203-001640	C-CER,CHIP;0.39nF,10%,50V,X7R,1608	
HC23	2203-000315	C-CER,CHIP;0.12nF,5%,50V,C0G,1608	
HC26	2203-001052	C-CER,CHIP;0.56nF,10%,50V,X7R,TP,1608	
HEATS	AH62-00062G	HEAT SINK-TR;HT-DS400,AL EXTR,-,-,-,-,-	
HEATS	AH62-00146B	HEAT SINK-AMP;COMMON,AL,-,38,62,-,-,-,36	
HEATS	AH62-30061F	HEAT SINK-TR;-,AL,-,15,40,-,-,-,-	
HL23	2703-001254	INDUCTOR-SMD;1.8uH,10%,2012	
IC HO	AH61-02183A	HOLDER-IC;HT-Q9,ABS+GF30%,-,-,-,-,-	
KIC2	1201-001572	IC-PREAMP;2011,SIP,8P,19.2x6.5mm,SINGLE,	
KR1	2007-001198	R-CHIP;820ohm,1%,1/8W,TP,2012	
KR2	2007-000468	R-CHIP;1Kohm,5%,1/8W,TP,2012	
KR3	2007-000221	R-CHIP;1.2Kohm,5%,1/8W,TP,2012	
KR4	2007-000241	R-CHIP;1.5Kohm,5%,1/8W,TP,2012	
KR5	2007-000267	R-CHIP;1.8Kohm,5%,1/8W,TP,2012	
KR6	2007-000493	R-CHIP;2.2Kohm,5%,1/8W,TP,2012	
L1SS	2702-001028	INDUCTOR-RADIAL;22UH,10%,10.3X18MM	
L2P	3301-000297	BEAD-AXIAL;25ohm,3.6x1.2x5.7mm,-,TP,-,-	
L5P	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	
LD1	0601-001238	LED;LTL-1CHESS-UA,ROUND,RED,3.1mm,697nm	
MC10	2203-000815	C-CER,CHIP;0.033nF,5%,50V,C0G,1608	
MC16	2203-000972	C-CER,CHIP;47nF,10%,16V,X7R,1608	
MC18	2203-000998	C-CER,CHIP;0.047nF,5%,50V,C0G,1608	
MC29	2402-001009	C-AL,SMD;100uF,20%,6.3V,GP,TP,5.3x5.3x5	
MC31	2203-001656	C-CER,CHIP;0.47nF,5%,50V,NP0,1608	
MC40	2203-001103	C-CER,CHIP;6.8nF,10%,50V,X7R,1608	
MC43	2203-000646	C-CER,CHIP;0.024NF,5%,50V,C0G,TP,1608	
MC45	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,1608	
MC5	2203-005221	C-CER,CHIP;15nF,10%,50V,X7R,1608	
MC50	2402-001049	C-AL,SMD;10uF,20%,16V,GP,TP,3.3x3.3x5.4	
MC52	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
MC53	2401-000042	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
MC6	2203-006170	C-CER,CHIP;220nF,10%,16V,X7R,1608	
MCON8	AH40-00129A	TUNER;KST-MW004FV1-E50LKOR,HT-Q40,FM	
MD3	0403-000509	DIODE-ZENER;MTZJ5.6B,5.4-5.7V,500MW,DO-3	
MDIC1	1003-001450	IC-MOTOR DRIVER;BA5954FM,SOP,28P,300MIL,	
MDIC2	1003-001508	IC-MOTOR DRIVER;FAN8082DTF,SOP,8P,200MIL	
MIC1	0801-002683	IC-CMOS LOGIC;74HCT245,TRANSCEIVER,TSSOP	
MIC1_	1002-001448	IC-A/D CONVERTER;AK5358ET,24,TSSOP,16P,5	
MIC2	1204-002233	IC-VOLUME/TONE CONT.;PT2399S,SO,16P,300M	
MIC3	1107-001505	IC-FLASH MEMORY;49BV162AT,16Mbit,1Mx16/2	
MIC4	1204-002224	IC-PAL/NTSC DECODER;ES6698FD,PQFP,208P,2	
MIC6	1103-001334	IC-EEPROM;K524A60X81,1KX8BIT,SOP,8P,5X4M	
MIC8	1105-001535	IC-DRAM;M12L128168A-7T,-,128MBIT,4X2MX	
MJ4	3708-002023	CONNECTOR-FPC/FFC/PIC;6P,1MM,SMD-S,TIN,N	
MQ1_1	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
MQ2	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
MR29	2007-000100	R-CHIP;68Kohm,5%,1/10W,TP,1608	
MR30	2007-000093	R-CHIP;20Kohm,5%,1/10W,TP,1608	
MR32	2007-000087	R-CHIP;6.8Kohm,5%,1/10W,TP,1608	
MR35	2007-000962	R-CHIP;5.1Kohm,1%,1/10W,TP,1608	
MR54	2007-000694	R-CHIP;3.3ohm,5%,1/8W,TP,2012	
MR63	2011-000651	R-NET;10ohm,5%,1/16W,L,CHIP,8P,TP,32	
MR65	2007-000643	R-CHIP;270ohm,5%,1/10W,TP,1608	
MR66	2007-000077	R-CHIP;470ohm,5%,1/10W,TP,1608	
MR93	2007-000118	R-CHIP;390ohm,5%,1/10W,TP,1608	
MREG1	1203-002425	IC-POSI.FIXED REG.;AP1117,SOT-223,3P,138	
MREG2	1203-002935	IC-POSI.ADJUST REG.;AIC1117ACE,TO-252,3P	
MV1	2101-001068	VR-ROTARY;10KB,-,1/20W,SIDE	
PB7	3301-001495	BEAD-SMD;120ohm,2012,2500mA,TP,115ohm/1	
PC2	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	
PC24	2401-001975	C-AL;47uF,20%,16V,GP,TP,5x11mm,5mm	
PS300	AH59-01687C	SPEAKER SYSTEM;PS-Q9,XSH,FRONT,REAR,CENT	
PS300	AH59-01731C	SPEAKER SYSTEM;PS-Q9,XSH,SUB W/F SPEAKER	
Q4	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q5	0501-000369	TR-SMALL SIGNAL;KSC2331-Y,NPN,1000mW,TO-	
R1P	2007-000502	R-CHIP;2.2ohm,5%,1/8W,TP,2012	
R24	2007-000116	R-CHIP;120ohm,5%,1/10W,TP,1608	
R2P	2007-001806	R-CHIP;1.5ohm,5%,1/10W,BK,1608	
R2RR	2007-000462	R-CHIP;18ohm,5%,1/8W,TP,2012	
R39	2007-000094	R-CHIP;22Kohm,5%,1/10W,TP,1608	
R3RR	2007-000518	R-CHIP;2.7Kohm,5%,1/8W,TP,2012	
R5SS	2007-000253	R-CHIP;1.5ohm,5%,1/4W,TP,3216	
R7FL	2007-000695	R-CHIP;3.3ohm,5%,1/10W,TP,1608	
RAC1	2003-000587	R-METAL OXIDE(S);22ohm,5%,1W,AA,TP,3.3x9	

Location no.	Code no.	Description & Specification	Remarks
RAU2	2007-000119	R-CHIP;560ohm,5%,1/10W,TP,1608	
RC1	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	
RC10	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,1608	
RC15	2203-001222	C-CER,CHIP;0.82nF,10%,50V,X7R,1608	
RC2	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,1608	
RC25	2203-000357	C-CER,CHIP;0.15nF,5%,50V,C0G,1608	
RC27	2203-000575	C-CER,CHIP;220nF,10%,25V,X7R,2012	
RC31	2203-000975	C-CER,CHIP;47nF,10%,25V,X7R,TP,1608,-	
RC40	2203-001634	C-CER,CHIP;33nF,10%,50V,X7R,1608	
RC5	2402-000167	C-AL,SMD;100uF,20%,10V,-,-,6.6x6.6x5.7m	
RCN1	3708-001765	CONNECTOR-FPC/FFC/PIC;24P,0.5mm,SMD-S,SN	
REM1	0609-001198	MODULE REMOCON;VERTICAL,19MM,TR	
REN1	3406-001109	SWITCH-ROTARY;5V,0.5mA,SPDT,12mm	
RFG1	2007-000033	R-CHIP;0ohm,5%,1/4W,TP,3216	
RG3	2007-000300	R-CHIP;10Kohm,5%,1/8W,TP,2012	
RIC1	1201-002059	IC-RF AMP;ES6603SF,LQFP,64P,10X10MM,SING	
RK1	2007-001071	R-CHIP;6.8Kohm,5%,1/8W,TP,2012	
RK12	2007-000029	R-CHIP;0ohm,5%,1/8W,TP,2012	
RK14	2007-000981	R-CHIP;5.6Kohm,5%,1/8W,TP,2012	
RK17	2007-000766	R-CHIP;330ohm,5%,1/8W,TP,2012	
RK20	2007-000477	R-CHIP;1Mohm,5%,1/8W,TP,2012	
RK21	2007-000123	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	
RK23	2007-000822	R-CHIP;390ohm,5%,1/8W,TP,2012	
RK37	2007-000872	R-CHIP;4.7Kohm,5%,1/8W,TP,2012	
RK5	2007-001177	R-CHIP;8.2Kohm,5%,1/8W,TP,2012	
RK8	2007-000409	R-CHIP;15Kohm,5%,1/8W,TP,2012	
RL2	3301-001069	BEAD-SMD;120ohm,1.6x0.8x0.8mm,200mA,TP,	
RP16	2007-000824	R-CHIP;390ohm,5%,1/4W,TP,3216	
RPW6	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	
RQ5	0501-000632	TR-SMALL SIGNAL;2SB1197K,PNP,200mW,SOT-2	
RR17	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	
RR34	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	
RR6	2007-000308	R-CHIP;10ohm,5%,1/8W,TP,2012	
RR9	2007-000122	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	
SMBC0	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
SMBD0	0402-000003	DIODE-BRIDGE;DF06M,600V,1A,DIP-4,ST	
SMC01	2201-000987	C-CERAMIC,DISC;2.2NF,20%,400V,Y5U,BK,12.	
SMC03	2201-002213	C-CERAMIC,DISC;0.47nF,10%,400V,Y,-,9.5X7	
SMC04	2401-003472	C-AL;100UF,20%,250V,GP,BK,16X31.5MM	
SMC08	2301-000474	C-FILM,LEAD-PEF;8.2nF,10%,50V,TP,6.5x12x	
SMC09	2301-000449	C-FILM,LEAD-PEF;47nF,10%,50V,TP,9.5x12.5	
SMC10	2401-002300	C-AL;47uF,20%,50V,GP,TP,6.3x11,5	
SMC11	2301-000375	C-FILM,LEAD-PEF;100nF,5%,50V,TP,11x12.5x	
SMC16	2305-001016	C-FILM,LEAD-PEF;10nF,10%,630V,TP,12.5x6.	
SMC18	2201-000551	C-CERAMIC,DISC;0.47NF,10%,1KV,Y5P,TP,6.3	
SMC41	2401-003139	C-AL;1000uF,20%,25V,WT,TP,10*20,5mm	
SMC43	2401-003378	C-AL;1000uF,20%,10V,WT,-,10x12.5,5	
SMC44	2401-001020	C-AL;3.3UF,20%,50V,GP,TP,4X7,5	
SMC46	2401-000357	C-AL;100uF,20%,50V,GP,-,8x11.5,3.5m	
SMC48	2401-000804	C-AL;220uF,20%,16V,GP,TP,8x9mm,5	
SMC49	2401-001355	C-AL;470uF,20%,10V,GP,TP,8x11.5mm,5	
SMC50	2401-000118	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	
SMC60	2201-000129	C-CERAMIC,DISC;0.1nF,10%,1000V,Y5P,-,7x4	
SMC61	2401-000740	C-AL;2200uF,20%,50V,LZ,TP,18x40,7.5	
SMC64	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
SMCM0	2301-001220	C-FILM,LEAD-PPF;100nF,10%,275V,BK,18x6x1	
SMD02	0402-001148	DIODE-RECTIFIER;1N4936,400V,1.0A,DO-41,T	
SMD04	0402-000012	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	
SMD41	0402-001377	DIODE-RECTIFIER;UG4D,200V,4A,TO-220F,TP	
SMD43	0402-000268	DIODE-RECTIFIER;SB360,60V,3A,DO-201AD,TP	
SMD50	0401-000005	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	
SMFU0	3601-000301	FUSE-CARTRIDGE;250V,6.3A,TIME-LAG,GLASS,	
SMIC0	1203-003336	IC-PWM CONTROLLER;KA5M0365,TO-220F-4L,4P	
SMIC0	1203-004084	IC-PWM CONTROLLER;FSDM0365RNB,DIP,8P,9.8	
SMIC4	1203-000294	IC-POSI.FIXED REG.;7808,TO-220,3P,-,PLAS	
SMIC4	1203-001586	IC-POSI.FIXED REG.;278R33,TO-220F,4P,-,P	
SMIC4	1203-001589	IC-POSI.FIXED REG.;278R05,TO-220F,4P,-,P	
SMIC4	1203-000165	IC-POSI.ADJUST REG.;78R12,TO-220,4P,-,PL	
SMIC4	AC14-12006D	IC;KA431Z,TO-92,TAPING	
SMLF0	AH29-00013A	FILTER LINE;HT-Q9,SQE-2424(SM100S,HM5A,-	
SMPC0	0604-000117	PHOTO-COUPLER;TR,130-260%,200mW,DIP-4,ST	
SMPN0	3711-000190	HEADER-BOARD TO CABLE;1WALL,2P,1R,7.92MM	
SMQ01	0501-000630	TR-SMALL SIGNAL;KTA1268,PNP,300MW,TO-92,	
SMR01	2001-000242	R-CARBON;1.5MOHM,5%,1/4W,AA,TP,2.4X6.4M	
SMR04	2001-000302	R-CARBON;10OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SMR05	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
SMR08	2003-000738	R-METAL OXIDE(S);56Kohm,5%,2W,AA,TP,4x12	
SMR43	2007-000830	R-CHIP;39Kohm,5%,1/8W,TP,2012	
SMR44	2007-001043	R-CHIP;56ohm,5%,1/8W,TP,2012	
SMR46	2007-000030	R-CHIP;560ohm,5%,1/8W,TP,2012	
SMR49	2007-000781	R-CHIP;33ohm,5%,1/8W,TP,2012	
SMR51	2001-000440	R-CARBON;1OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SMR62	2007-000457	R-CHIP;18Kohm,5%,1/8W,TP,2012	
SMR64	2007-000290	R-CHIP;100ohm,5%,1/8W,TP,2012	
SMR68	2007-000586	R-CHIP;22Kohm,5%,1/8W,TP,2012	
SMT01	AH26-00338A	TRANS POWER;-,HT-Q9,1.2mH,15,-,VARIABLE,	
SMT02	AH26-00337A	TRANS POWER;EER2828(PL-5,PM5),HT-Q9,620,	
SMTH0	2006-001004	R-CEMENT;2.7OHM,5%,2W,CB,BK,11X20.5X7.5	
SMVR0	1405-000001	VARISTOR;470V,1250A,14x7.5mm,TP	
SMZD0	0403-001170	DIODE-ZENER;MTZJ9.1C,8.89-9.29V,500MW,DO	
SPK1	3716-001243	TERMINAL-BLOCK;-,12P,14mm,-,-	
UC12	2401-000240	C-AL;100uF,20%,10V,GP,TP,5x11,5	
UC16	2203-000206	C-CER,CHIP;100nF,10%,50V,X7R,2012	
UC18	2203-000236	C-CER,CHIP;0.1nF,5%,50V,C0G,1608	
UC2	2401-000759	C-AL;220nF,20%,50V,GP,TP,5x11mm,5mm	
UC6	2409-000123	C-EDL;47000uF,4uA,5.5V,-,BK,-,5mm	
UC8	2203-005249	C-CER,CHIP;100nF,10%,50V,X7R,1608	
UD10	0401-001090	DIODE-SWITCHING;1SS355,80V,100MA,SOD-323	
UIC1	AH09-00111A	IC MICOM;GMS87C2020,HT-Q9,64PIN,2.7V~5.	
UQ1	0501-000341	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
UR11	2007-000065	R-CHIP;2.2Mohm,5%,1/10W,TP,1608	
UR12	2007-000402	R-CHIP;150ohm,5%,1/10W,TP,1608	
UR17	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
UR19	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	
UR24	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	
UR46	2007-000106	R-CHIP;220Kohm,5%,1/10W,TP,1608	
UR51	2007-000449	R-CHIP;180ohm,5%,1/8W,TP,2012	
UR6	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	
UR9	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	
UX1	2802-000188	RESONATOR-CERAMIC;8MHz,0.5%,TP,10.0x5.0x	
VC2	2401-000303	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
VC38	2401-001092	C-AL;330uF,20%,10V,GP,-,8x11.5,2.5m	
VC49	2203-000280	C-CER,CHIP;0.01nF,0.5pF,50V,C0G,1608	
VFD H	AH61-02181A	HOLDER-VFD;HT-Q9,ABS,-,-,-,-,-	
VJ5	3722-002027	JACK-PIN;6P/6C,SN,YEL/GN/WH/BL/RD,ANGLE	
VL29	2703-000272	INDUCTOR-SMD;1.2uH,10%,2012	
VQ3	0501-000002	TR-SMALL SIGNAL;KSA812,PNP,150MW,SOT-23,	
VR17	2007-000076	R-CHIP;330ohm,5%,1/10W,TP,1608	
VR51	2007-001134	R-CHIP;68ohm,5%,1/10W,TP,1608	
VR56	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR7	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	
WC5	2401-002042	C-AL;220uF,20%,10V,GP,TP,6.3x11,5	
WC9	2203-000727	C-CER,CHIP;3.9nF,10%,50V,X7R,2012	
X2	2801-004284	CRYSTAL-SMD;27MHZ,10PPM,28-AAN,20PF,30OH	
XD9	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	
ZD5	0403-000355	DIODE-ZENER;UZ5.1BSB,5-5.2V,500MW,DO-35,	
	3101-001300	MOTOR-DC;2670RPM,9G.CM,3.9V,160MA	
	AH59-01592A	DECK-CD;-,CMS-S75RB,MAGNET,23.2mm,3V,S	
	3301-001760	CORE-FERRITE;-,33x12x8mm,-,-	
	3809-001627	CABLE-FLAT;30V,80C,90mm,6P,1mm,UL20696	
	3809-001630	CABLE-FLAT;30V,80C,175mm,24P,0.5mm,UL206	
	AH39-00884A	LEAD CONNECTOR-ASSY;SDM-D12,-,-,5P,150mm	
	AH61-01742A	BODY CLAMPER-UPPER;-,POM,0.8,-,-,-,WHT,-	
	AH61-01743A	BODY CLAMPER-LOWER;-,POM,0.8,-,-,-,WHT,-	
	AH63-00695A	TRAY-DISK;SDM-D11,ABS,-,-,-,-,GRAY,-	
	AH63-00905A	FELT-DECK;SDM-D12,FELT,0.8,10,18,-,DOUBL	
	AH66-00261A	CAM-SLIDE;K100,POM,-,-,WHT,-,-,-,-	
	AH73-00058A	SILICON/RUBBER-DECK;CMS-SD100,SILICON,D1	
	AH61-02182A	HOLDER-MEHCA;HT-Q9,ABS,-,-,-,-,-	
	3301-000132	CORE-FERRITE;AC,28.8x19.3x7.5mm,1400,290	
	6902-000360	BAG PE;HDPE,T0.03,L360,W250,TRP,8,1,P	
	AH39-00257J	CBF-POWER CORD;DVC90,-,CP2(5.0),250V,2.5	
	AH39-40001V	CABLE-AUDIO CABLE;-,-,1P-1P,3000MM,-,-,-	
	AH42-00021A	ANT FM T;T18011F-1,75 ohm,1800mm	
	AH59-01615E	DECK-1DVD MECHA;AH59-01615E,HT-Q20,T TYP	
	AH59-01657A	REMOCON-ASSY;HT-Q9,SAMSUNG,50,200,-60,-	
	AH92-02518C	ASSY PCB-MAIN3;HT-Q9/XEU,MAIN,ENGLAND	

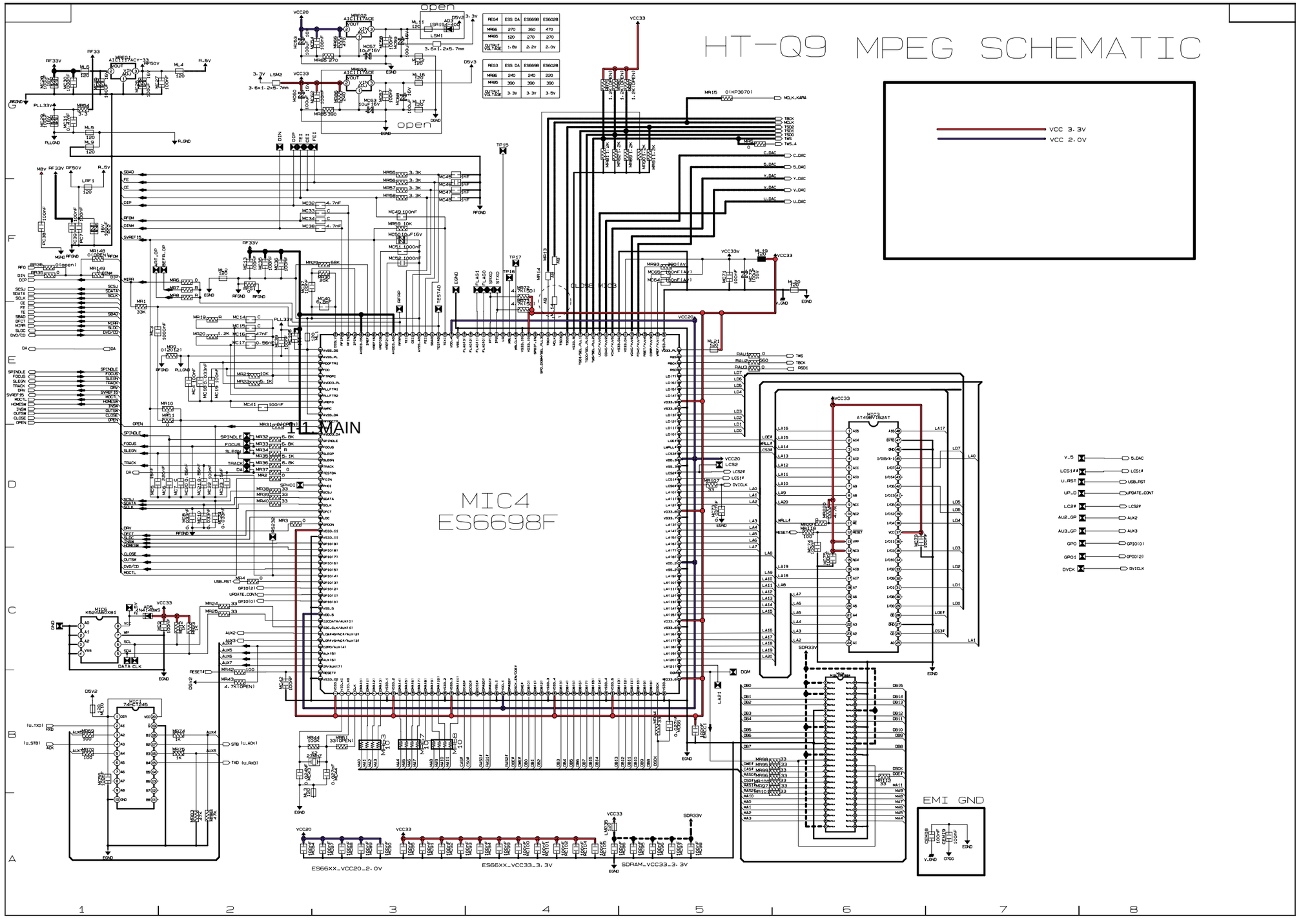

HT-Q9 Block Diagram for Audio
GMS 87C2020
uCOM
RXD
TXD
ACK
STB
8Mhz
S
Fairchild/
74HTC245
+3.3V
STB/ACK
TXD/RX
RBCK (I)
/RWS (I)
◎MPEG
ESS
ES6698
VIDEO 6CH
MCLK (I/O)
TBCK (O)/TWS (O)
RSD1
27Mhz
TSD 0
TSD 1
TSD 2
MCLK
TBCK/TW
TSD3
19:SCL
20: SDA
64:RST
◎PWM Processor
S0064
DVDD:3.3V
AVDD_PLL:1.8V
MCLK:6
SCLK:8
LRCLK:7
PWM_HP L/R
5,15:RST
2:OTW
3:SD
4 PWM
3 PWM
◎Output
Stage
TAS5142
GVDD:12V
PVDD:31.5 V
PVDD:31.5V
Passive
LPF
Tuner Module
Analog:+12V
1-1. MAIN
← MPEG Master
AIN 3
AIC3
Wolfson
WM8775
Analog +5V
Digital +3.3V
AIN 1
AUX1
MCLK
TBCK/TWS
RSD1
MIC1
ADC
Asahikasei
AK5358
Analog +5V
Digital +3.3V
AIN
Mic
MICIN
MIC SIGNAL
COMPOSITE
COMPONEN
Y
PB
PR
+6dB


HT-Q9 Block Diagram for Audio
GMS 87C2020
uCOM
RXD
TXD
ACK
STB
8Mhz
S
Fairchild/
74HTC245
+3.3V
STB/ACK
TXD/RX
RBCK (I)
/RWS (I)
◎MPEG
ESS
ES6698
VIDEO 6CH
MCLK (I/O)
TBCK (O)/TWS (O)
RSD1
27Mhz
TSD 0
TSD 1
TSD 2
MCLK
TBCK/TW
19:SCL
20: SDA
64:RST
◎PWM Processor
S0064
DVDD:3.3V
AVDD_PLL:1.8V
MCLK:6
SCLK:8
LRCLK:7
PWM_HP L/R
TSD3
5,15:RST
2:OTW
3:SD
4 PWM
3 PWM
5,15:RST
2:OTW
3:SD
◎Output
Stage
TAS5142
GVDD:12V
PVDD:31.5 V
5,15:RST
2:OTW
3:SD
◎Output
Stage
TAS5142
GVDD:12V
PVDD:31.5V
Passive
LPF
Passive
LPF
Passive
LPF
Passive
LPF
Tuner Module
Analog:+12V
1-1. MAIN
← MPEG Master
AIN 3
AIC3
Wolfson
WM8775
Analog +5V
Digital +3.3V
AIN 1
AUX1
MCLK
TBCK/TWS
RSD1
MIC1
ADC
Asahikasei
AK5358
Analog +5V
Digital +3.3V
AIN
AIN
Mic
MCLK
TBCK/TWS
MICIN
MIC SIGNAL
COMPOSITE
+6dB
COMPONEN
Y
+6dB
PB
+6dB
PR
+6dB

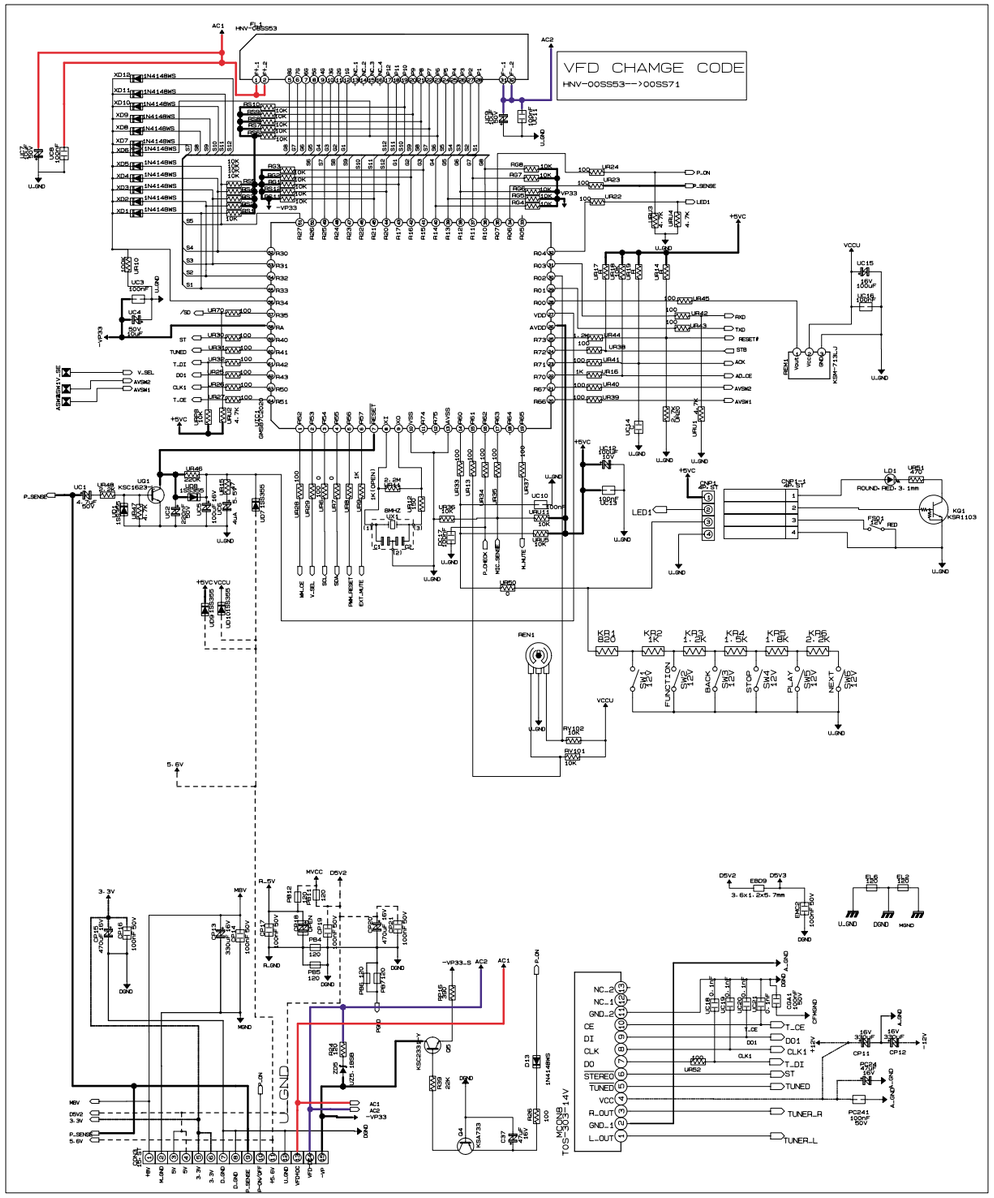
11-1. PCB Layout



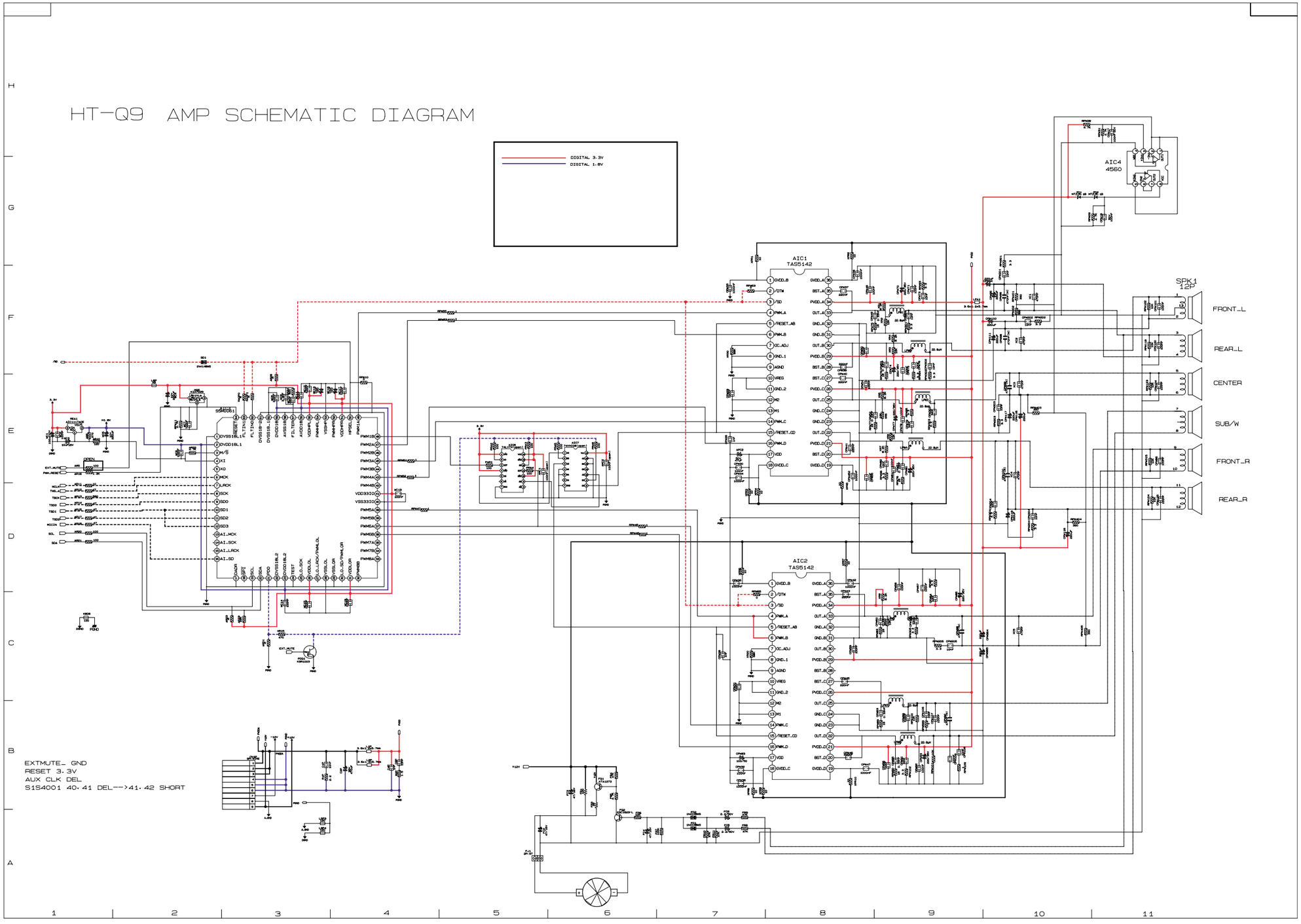
1. MAIN-1


HT-Q9 MPEG SCHEMATIC
VCC 3.3V
VCC 2.0V
1. MAIN
MIC4
ES6698F
CLOCK MICOM
EMI GND
ES66XX_VCC20_2.0V
ES66XX_VCC33_3.3V
SDRAM_VCC33_3.3V

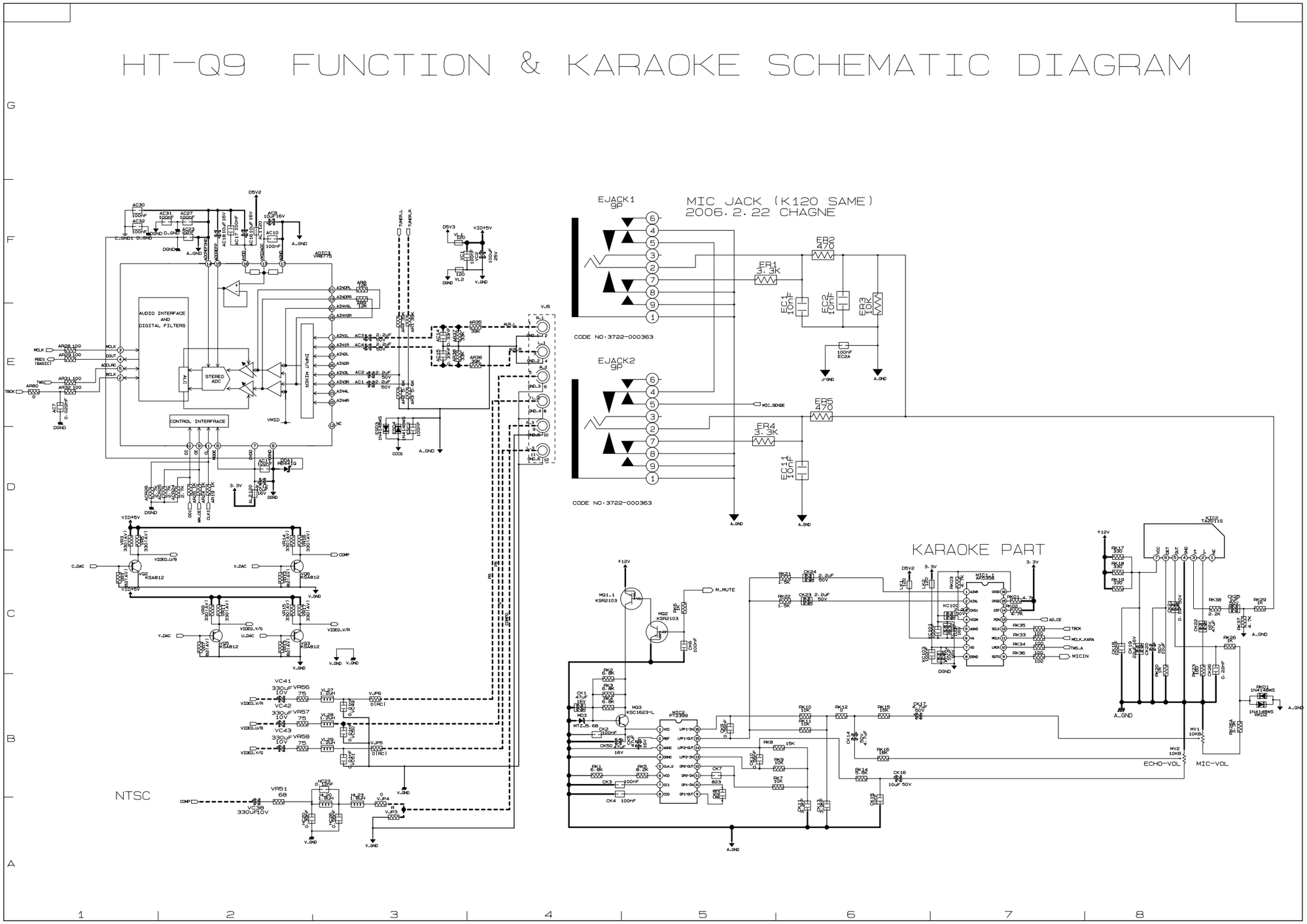
HT-Q9 MAIN SCHEMATIC DIAGRAM-2



HT-Q9 AMP SCHEMATIC DIAGRAM



HT-Q9 FUNCTION & KARAOKE SCHEMATIC DIAGRAM

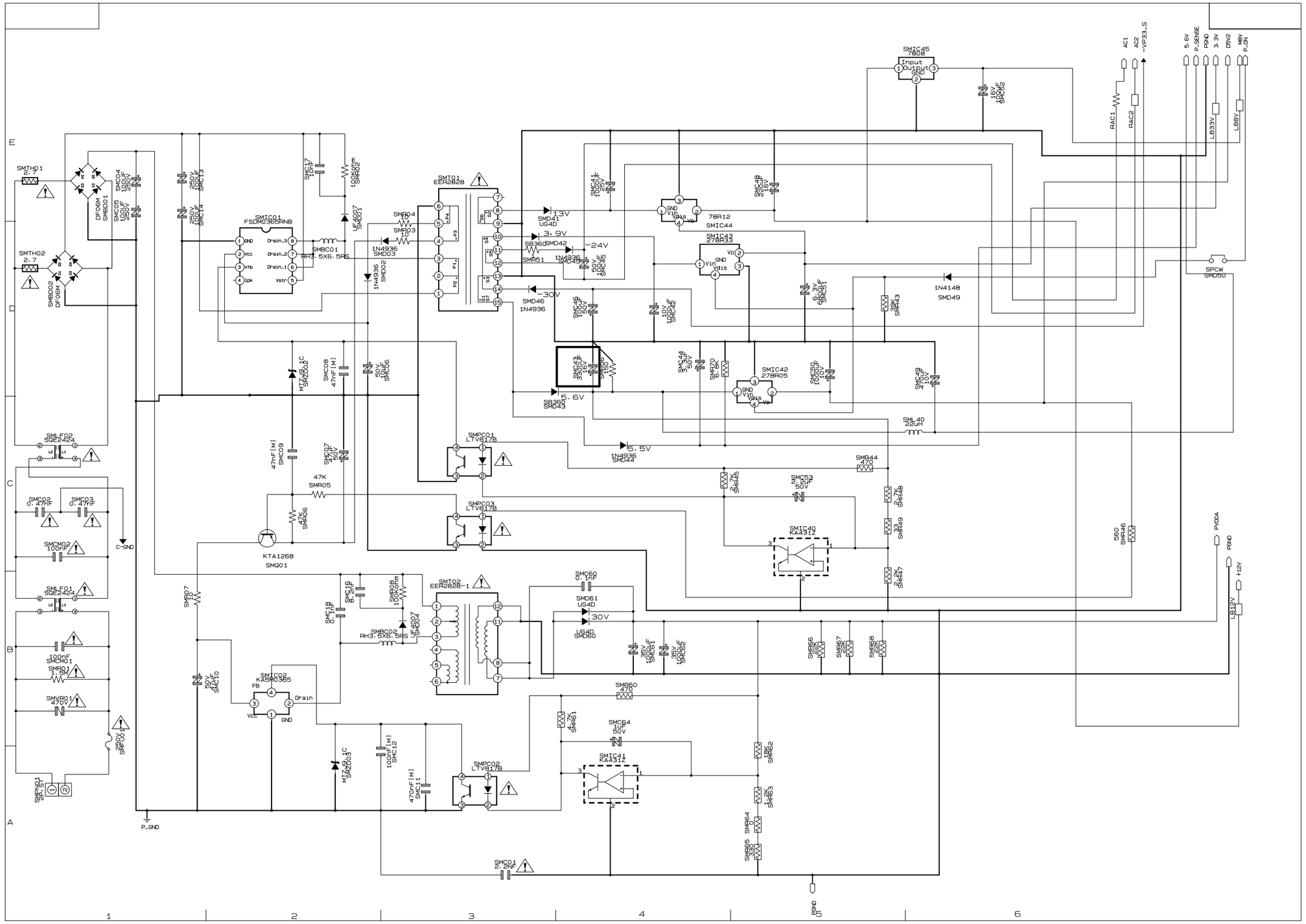


HT-Q9 RF PCB SCHEMATIC

RF CIRCUIT CHANGE -->ALT HALT TEST NG IMPROVEMENT
2006.2.18 LAST VBERSION

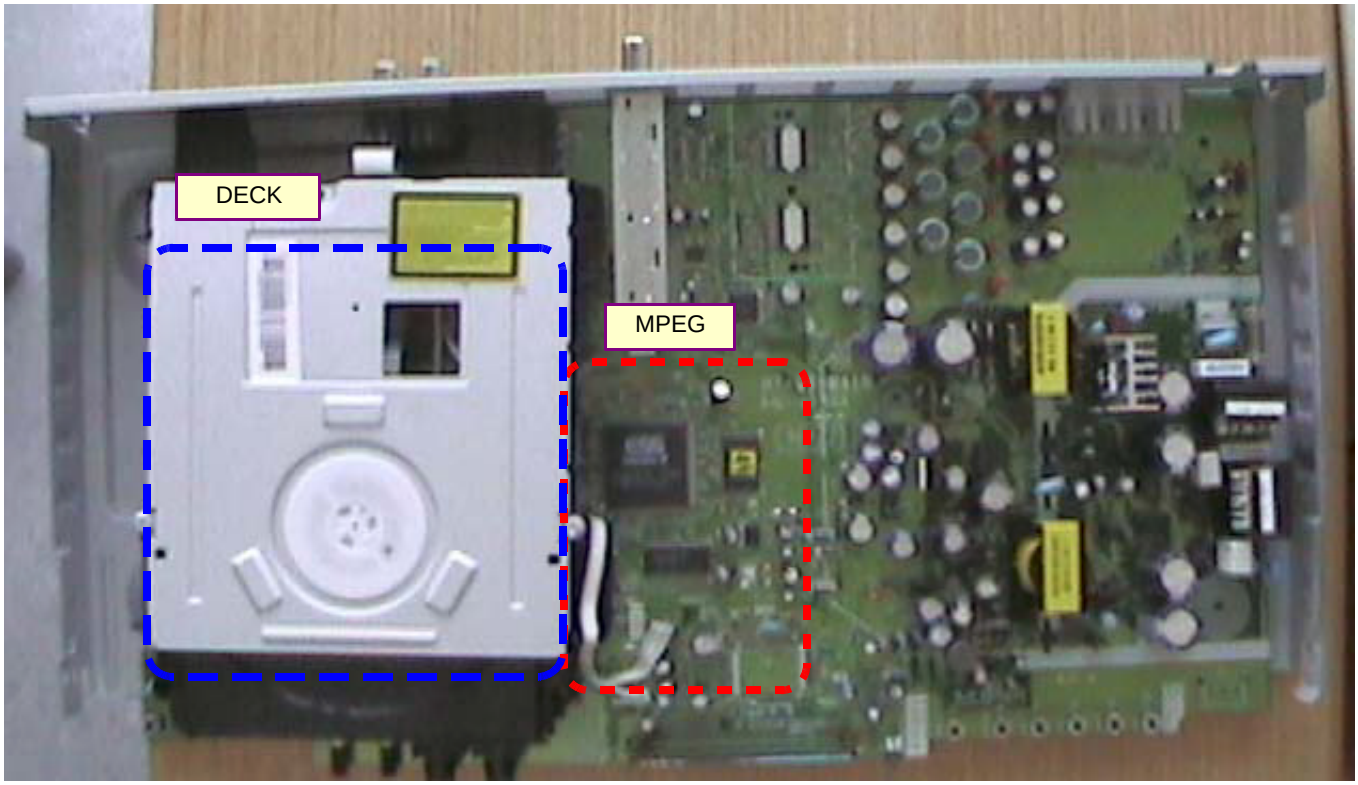
RF IC-DRIVE IC : AS FAR AS POSSIBLE

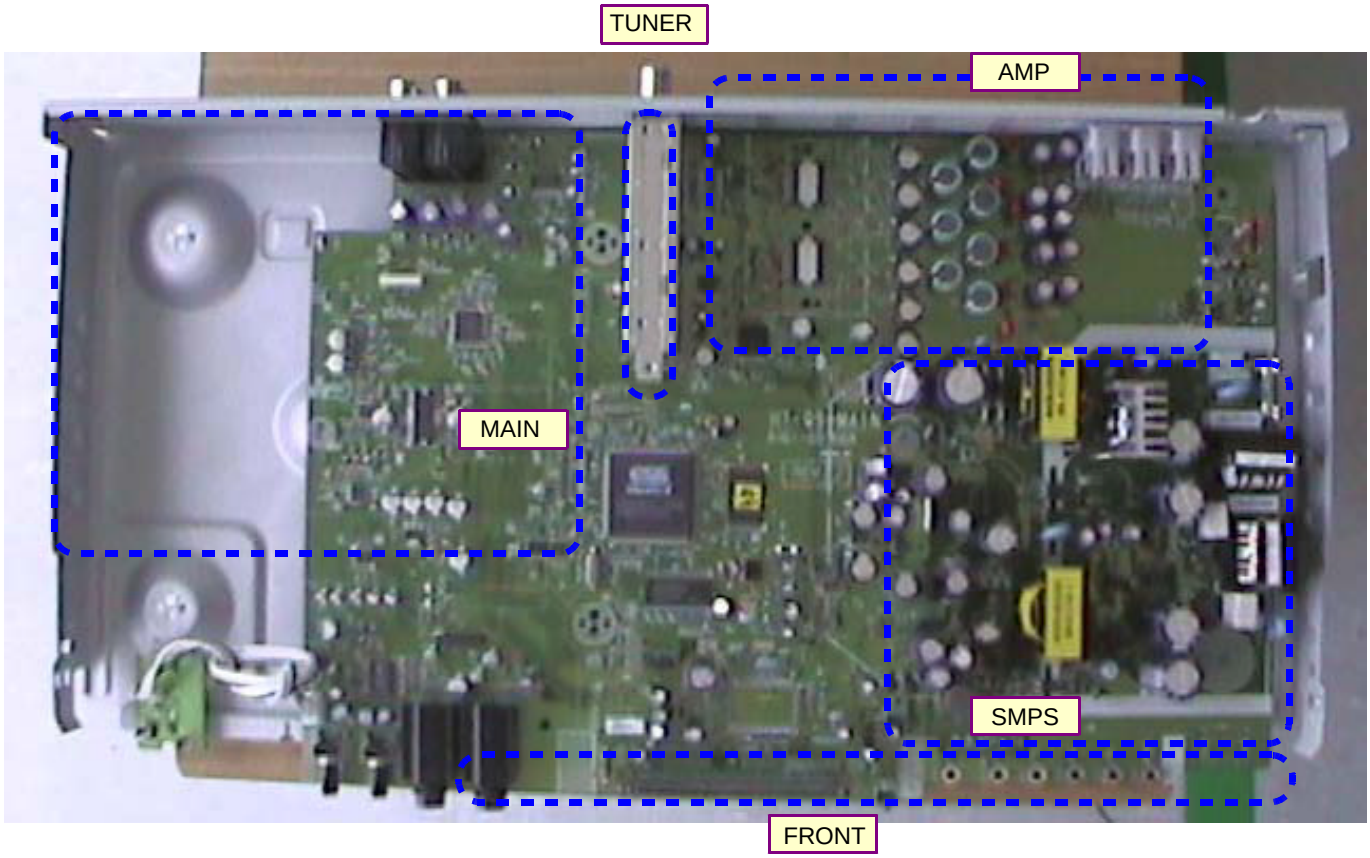
RF +5.0V
MVCC +5V


SMTH01
47
SMTH02
2.7
SMBD01
DF06M
SMBD02
DF06M
SMC04
100UF
SMC05
100UF
SMC13
SMC14
SMC17
10nF
SMR02
100Kohm
SMTC01
FSDM0365RNB
SMBC01
RH3.5X6.5RS
UF4007
SM001
SMR04
10
SMR03
10
1N4936
SM003
1N4936
SM002
SMTR01
EER2828
SMD41
UG4D
3.9V
SB360
SMD42
-24V
SMR51
1N4936
SM045
SMC14
SMC15
SMIC45
78D8
Input
Output
GND
SMC45
SMIC44
78R12
SMC43
278R33
SMC48
SMC49
SMD48
1N4148
SMD49
SMC47
SMC46
SMR43
SMD46
1N4936
-30V
SMC41
SMC42
SMR41
SMR42
SMC44
SMR40
SMIC42
278R05
SMC50
SMC49
SMD43
SB360
5.6V
SMC08
47nF[M]
SMC09
47nF[M]
SMC07
47nF
SMR05
47K
SMR06
47K
SMPC01
LTV817B
SMPC03
LTV817B
SMD44
1N4936
5.5V
SMR44
470
SMR45
4.7K
SMC53
10nF
50V
SMIC40
KA431Z
SMR48
4.7K
SMR49
33
SMR47
2.2K
SML40
2uH
SMR46
560
SPCW
SMD50
AC1
AC2
-VP33_S
5.6V
P_SENSE
PGND
3.3V
D5V2
M5V
P_ON
RAC1
RAC2
LB33V
LB5V
PVDDA
PGND
+12V
LB12V
SMF01
SMF02
SQ2424
SMC02
0.47nF
SMC03
0.47nF
SMC01
100nF
SMCM01
SMR01
1.5M
SMVR01
470V
SMFN01
SF-301
250V
SMF001
C_GND
P_GND
SMC10
100nF
SMR07
10
SMC18
0.1nF
SMR08
100Kohm
SMC16
0.1nF
SMBC02
RH3.5X6.5RS
UF4007
SM004
SMTC02
KA5M0365
SMC11
50V
SMC06
SMR10
470
SMC12
100nF[M]
SMC01
2.2nF
SMC60
0.1nF
SMD61
UG4D
30V
UG4D
SMD60
SMC62
SMR65
SMR67
SMR68
SMR60
470
SMR61
4.7K
SMC64
47nF
50V
SMIC41
KA431Z
SMR62
SMR63
SMR64
SMR65
MTZJ-B 1C
SKZ003
470nF[M]
SMC61
SMPC02
LTV817B
KTA1268
SMQ01
1
2
3
4
5
6
A
B
C
D

13. Circuit Description

1. Description (HT-Q9)





BLOCK	Description	Note
SMPS-PART	◇ **AC supply voltage and MICOM operating voltage** - From The AC-Power Cord, AC input voltage goes into Main power trans, passing through Protection circuit (Fuse, Varistor) of SMPS and then, Main unit is in the STAND-BY condition - In STAND-BY condition, If Power-ON S/W turn on, SMPS supply whole operating voltage to Main-PCB ◇ **CONNECTOR Specification** ① M8V : Voltage for IC(BA5954) used for Disc Tray Eject and Motor Control ② P/S: POWER-SENSE, A terminal for AC Input Voltage check, It must be "high",so MICOM can make Main Unit turn on (about +5V) ③ P/ON : POWER-ON, MICOM make this terminal high, so All needed voltage for MAIN PCB is supplied from SMPS (about +5V) +5V : Digital +5V, USB,ADC,FR,DIR IC Supply Voltage ④ +5.6V : MICOM 5.6V In STAND-BY Condition, This terminal supply MICOM, VFD IC, POWER RED LED operating voltage (about +5.6V) ⑤ VP: Negative drive voltage (-34v) of the VFD DRIVER IC. ⑥ VFD DC: FILAMNET DRIVE Voltage (power on: +4.4V) ⑦ A5V : AD CONVERTER(WM8775) DRIVE Voltage ⑧ D5V: MECHT Drive Power.	
MAIN-PART	◇ **MAIN MICOM** - 8MHz Resonator - CLK : S5M0061,WM8775,TUNER in common - DATA : S5M0061,WM8775,TUNER in common ◇ **JACK Part Connector** - Input : AUDIO 1 - Output : COMPOSITE / COMPONENT(Y/Pb/Pr)	
FRONT-PART	◇ **FRONT PART** - VFD drive and LED operation / REMOCON operation / Main Set KEY operation, Front part's function CONTROL. ◇ **VFD and VFD DRIVER IC** - STAND-BY시 RED LED , POWER-ON => VFD - AD circuit(SWITCH) ◇ **VOLUME Part** -ENDLESS ROTARY VOLUME.	
AMP-PART	◇ **AMP Part** - I2S DATA generated from MPEG is input to Modulator each channel. ThroughFull bridge AMP IC, Low Pass Filter, Analog Signals are generated. - TAS5142 (FR/RR,FL/RL,C,SW CHANNEL) ◇ **PROTECTION Circuit** - Sensing AMP IC's abnormal action, inform TI-SD MICOM PORT(ACTIVE LOW) - PROTECTION TYPE * SHORT CIRCUIT : Short between SPK Output +/- or SPK output and Chassis * OC(OVER CURRENT PROTECTION) : Derivation over-current of Output * OT(OVER TEMPERATURE PROTECTION) : If Temperature of IC-Junction exceed 150℃, It generally must be under 125℃. NOT In use. * UV(UNDER VOLTAGE PROTECTION) : more than UVP THRESHOLD Voltage.	
MPEGP-PART	◇ **MPEG MICOM** - ES6698 MPEG IC / Realization DPL2,DTS,DD,Divx	

1. Definition of Home Theater

What is Home Theater?

Home theater system is the proper combination of audio and video system at home which enable you to enjoy more dynamic sound and vivid image in a wide screen of movie theater.

This effect can be implemented with wide screen, high quality projector, Dolby digital and DTS sound effects.

Now you can enjoy surround sound field wieh realistic presence and Dolby digital at your home as if you are in a movie theater.

As time goes by, home theater system has become recognized as a system that helps listen sound closer to the original sound rather than video. In this 21st century, most movie and animation films will be produced for home theater and reproduce sound closer to original sound.

2. Concept of Sound

What is Sound Range?

People can listen to the sounds with frequency between 200Hz~20.000Hz

High	3,000Hz~20,000Hz	Highest sound (Ex– Woman's screaming, high sound of organ)
Middle	200Hz~3,000Hz	Most common sound in our daily lives (Ex– movie words, music)
Low	20Hz~200Hz	Lowest sound range that human can listen to (Ex– explosion sound, strong drum sound)

As time goes by, home theater system has become recognized as a system that helps listen sound closer to the original sound rather than video. In this 21st century, most movie and animation films will be produced for home theater and reproduce sound closer to original sound.

What is Sound Pressure?

* A measure of how well speaker converts electric signal it receives to sound
* Unit of sound pressure is decibel and mainly measures the size of sound at 1 m away after sending 1 W power from speaker.
  ❋ High sound pressure doesn't necessary mean good performance

What is Timbre?

* How well the unique sound of musical instrument is expressed
* Better if violin and cello sound are accurately distinguished. Good timbre means high quality.

2. Concept of Sound

By reproducing standard channels used during soundtrack recording of movie, it outputs 3 sounds of movie (words / music / sound effects) from 6 different speakers and provides surround dynamic sound effects so that you can even feel the direction of sound.

5.1 channel sound

5 channel

- Ⓐ Center Speaker : Voice (over 95%)
- Ⓑ Front Speaker (L/R) : Music Sound
- Ⓒ Rear Speaker (L/R) : Sound Effect

0.1 channel

- Ⓓ Subwoofer : Low Sound Effect

* Power amp is embedded in active sub woofer
* Require separate amp since there is no amp in passive sub woofer
  ❋ No difference in performance of active sub woofer and passive sub woofer

4. Home Theater Sound Format

Overview

* As home theater has recently penetrated deep into consumer's market in Korea, Dolby digital and DTS, the sound format for 5.1 channel home theater, are the mainstream in the market.
* Expanded type of 6.1 channel or 7.1 channel are recently released in the market, but there are not much DVD title that can support expanded type.

1958	**1Ch Mono/ 2Ch Stereo**
1982	**Matrix 3Ch Dolby Surround**
1987	**Matrix 4Ch Dolby Pro Logic**
1995	**5.1Ch Dolby Digital**
1997	**DTS (Digital Theater System)**
1999	**Matrix 6.1Ch Dolby Digital Sourround EX**

Home theater format...

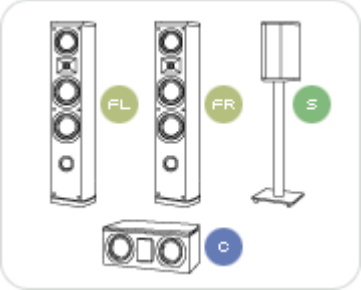
Stereo

Is used in general audio and analog TV and and consists of 2 channels, at front left/right

Dolby Surround

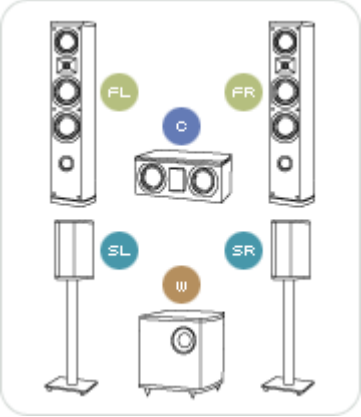
In this sound format, 4 audio channels (Front left / right / center / surround) are entered in 2 channel and reproduce in 4 channels through device with Dolby decoder.

Center channel is not completely separated so that it forms virtual center channel with help of front left / right channel.



Dolby Prologic

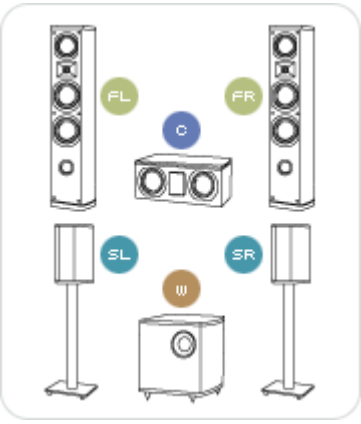
– Provide 4 channels (Front Left/Right/Center/Surround)
– Reinforced from Dolby Surround
① Center channel is completely separated
② Separation between channels gets higher



Dolby Digital

– Provide completely separate 5.1 channel
(Front Left/Right, Center, Rear Left/Right, Sub Woofer)
– Main sound format of home theater
– Reinforced from Dolby Prologic
– Rear surround left/right channels give different sound
– Support sub woofer reinforcing Bass

✻ Dolby Digital is also called AC-301
AC-3(Audo-Coding-3) : 3rd digital audio coding Dolby Research Center has developed.

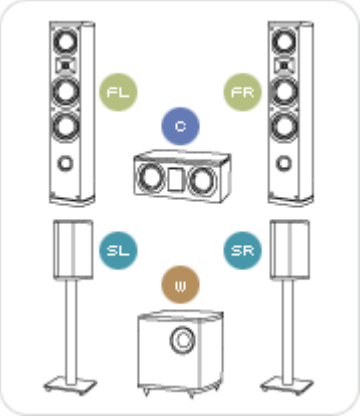


DTS(Digital Theater System)

– Technology of providing 5.1 channel sound, higher quality than Dolby Digital
– Home appliance produced to apply system installed at 1,800 theaters throughout the world.

✪ Comparison of DTS and Dolby Digital(DD)

SPEC	구분		설명
	DTS	DD	
S/N Ratio	High	Low	Signal to Noise ratio. The higher the S/N ratio, the clearer the sound gets
Compression	Low	High	Less compression of original sound results in less loss of reproduction and clearer sound.
Sound Separation	Big	Little	The bigger the sound separation, the clearer the sound from each speaker.
Transmission	Many	Few	The more information it transmits per second, the clearer the sound gets.



Dolby Prologic

– Latest technology reproducing music CD recorded in 2 channel, cassette tape and video tape made in Dolby Prologic into 5.1 channel.

– Surround speaker that makes you feel more natural, deeper and wider than existing Dolby Prologic.
(Ex-Profound sound adds more realistic presence from 5 speakers and sub woofer when you watch soccer match.)

DTS (Digital Theater System)

THX (Abbreviation of Tomlison Holman's Experiment)

– THX is not a sound format like a Dolby or DTS, but is a standard of sound. Like standard KS mark in Korea, THX means good certification in sound effects.

– THX issues certificate when a movie, theater or home theater system satisfy proper standards.

5. Home Theater Components

Display (Flat, Onjection, LCD, PDP TV, Projecter, etc.
DVD Receiver or DVD Player + AV Receiver
Speaker System (2EA)
Rear Speaker (2EA)
Center Speaker
Subwoofer

Amp / Receiver

Amp: Device of raising output after tuning signal of CD player or DVD into unique sound timbre

Various Types and Usages of Amplifier

- For Listening to Music ¡æ For Music+ Movie
- ① AV Receiver (Dedicated Lamp for Home Theater) : Preferred by Home Theater mania.
  ② DVD Receiver (DVD Player+ Amp+ Radio Tuner) : Suitable for beginner of Home Theater
- Many A/V companies adopt DVD receiver type for expansion of easy and economic Home Theater system.

Popular Korean Products

- Popular for those who pursue relatively good sound quality at low price
- Product priced between 400,000 won~600,000 won are popular.

Popular Foreign Products

– Popular for those who prefer profound sound volume/output(Hi-fi mania, Home Theater mania)
– Products in the range of middle and low price such as Denon, Yamaha, Onkyo (900,000~1.1 million won) are popular.
– There is very expensive product over 10 million won among foreign audio markers such as Merdian, Mcintosh, Krell.

Type of Amp/Receiver

* Pre Amp

A device that receives, adjusts and sends signal from source devices (tape deck, CD player, radio tuner, etc.) to power amplifier.

* Power Amp

A device that amplifies the signal from Pre Amp into big sound so that speaker can vibrate.

* Integrated Amp

A device that combines pre-amp and power amp into one.

* Receiver

A device that contains tuner for radio broadcasting and integrated amp.

A/V Receiver

General Amplifier
– Support 2 channels (Left, Right Speaker)
– Mainly reproduce music
– No decoder : cannot cope with various sound formats

A/V Receiver
– Support multi-channel (support 5.1 channel)
Launch products supporting 6.1 channel and 7.1 channel recently.
– Reproduce music and movie sound realistically
– Has decoder
Can cope with various sound formats such as Dolby Digital.

DTS
– Rich input/output
– Use digital signal type and has no sound

A/V Receiver

A device of implementing home theater more conveniently with radio and A/V receiver embeded in DVD player.

How to Select Amp/Receiver

- Select the products that can support both Dolby Digital and DTS since they require both for vivid sound

- Performance of amp gets better in output(W) but high output is a burden in narrow house.
- Important to match output(W) and capacity(§Ù) of amp and speaker.
- It is advantageous for beginners to purchase DVD receiver type that has amp and radio tuner in DVD player
- If the budget is tight, it is recommended to continue to upgrade after purchasing a low-priced system.

  * Computer will be of no use when it is outdated.
  * But, home theater system can be utilized in various ways due to feature of A/V device.

Speaker

Speaker system consists of speaker unit and enclosure.
The type and price range are diverse from expensive big speaker to miniature thin speaker.
Difference between famous speaker and big A/V speaker

- Speaker units are similar(there are a few several speaker unit makers in the world)
- Design, finishing, assembling and tuning process of enclosure are different.
  (Prestige speakers are made manually in whole processes of manufacturing)

Famous speaker brands: B&W, JBL, BOSE, Definitve, B&O, etc.

Tallboy Type

A speaker directly installed on the floor without separate speaker in the height of 90 ~ 120 cm.

Bookshelf Type

A small speaker that can be placed in bookshelf. Good for utilization of space since it can be mounted on the wall when installing home theater system in a narrow space.

Speaker Structure

Speaker Unit

- Divided into for high tone, middle tone and low tong
- Tweeter : for high pitch
  Smallest unit suitable for feature of high tone reproduction
- Mid-Range : for middle tone
  Mid sound reproduction ability is the most critical standard of speaker evaluation
- Woofer : for low tone
  Much bigger size than other speaker unit

Enclosure

- Case of speaker unit
- Enclosure sways sound quality of reproduction
- Low tone is almost acattered without enclosure, and only high sound tone is heard.

Type of Speaker System

Full Range Speaker

A speaker system producing sound with one speaker unit.

2 Way Type

A speaker system designed using units of 2 woofers for bass and tweeter for high tone.

3 Way Type

Difference between foreign prestige speaker and big A/V maker's speaker.